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A N T I E N T
M E T A P H Y S I C S:

O R, T H E
S C I E N C E O F U N I V E R S A L S.

W I T H A N
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A N E X A M I N A T I O N O F T H E P R I N C I P L E S
O F S I R I S A A C N E W T O N ' s P H I L O S O P H Y.

V O L U M E F I R S T.

Magni est ingenii revocare Mentem a Sensibus, et Cogitationem a Consuetudine
abducere.

CICER. *Tusculan. Quaest. Lib. 1. Cap. 16.*

E D I N B U R G H:
P R I N T E D F O R T. C A D E L L, L O N D O N; A N D J. B A L F O U R A N D C O, E D I N B U R G H.
M, D C C, L X X I X.

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THE
METAPHYSICS

OF

ARISTOTLE

WITH AN

INTRODUCTION

CONTAINING

AN EXAMINATION OF THE PRINCIPLES
OF HIS METAPHYSICS



VOLUME FIRST

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ERRATA.

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ERRATA.

- Page 9. l. 10. *for move read* are moved
 ib. l. 13. *for move read* are moved
 15. l. 12. *for architect read* archetype
 21. l. 21. *for moves read* is moved
 ib. l. 22. *for move read* be moved
 159. l. 13. *for Noctambule read* Somnambule
 166. l. 1. *for all as read* as all
 ib. l. 20. *for like read* like in man
 167. l. 12. *for two read* two, the vegetable and the animal;
 ib. l. 26. *for vines read* vines
 168. l. ult. *for indivisible, and, by consequence, without parts, read* Without
 parts, and, by consequence, indivisible,
 175. l. ult. *add to the note* p. 85.
 192. l. 23. *for stones read* stone weight
 ib. l. 25. *for stones read* stone weight
 229. l. 16. *for (ψυχῆν) read* (ψυχῆν)
 233. l. 10. *for 1690 read* 1698
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 292. l. 10. *for κατὰ μείζονος read* κατὰ σμικρότερον
 294. l. 31. *for distinction read* destination
 431. l. 12. *for reducible read* deducible
 441. l. ult. *for philosophy read* philosopher

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1. The first is the *philosophy* of the *philosophy*.
 2. The second is the *philosophy* of the *philosophy*.
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 8. The eighth is the *philosophy* of the *philosophy*.
 9. The ninth is the *philosophy* of the *philosophy*.
 10. The tenth is the *philosophy* of the *philosophy*.

P R E F A C E.

HOWEVER little merit there may be in this Work, or however much wearied the reader may be in the perusal of it, he cannot blame the Author for a deceit, common enough at present, of imposing upon him by a specious title ; for I have chosen one which, so far from alluring readers, will frighten many from opening the book ; nor do I believe that there is a bookseller in Great Britain, who upon the credit of my title-page, would offer me a shilling for my copy, if I had a mind to sell it. Indeed, the subject is altogether unfashionable, not only among the vulgar, who ridicule it under the name of *metaphysic*, but even among the philosophers of the present age, who are so much conversant with particular and individual things, as hardly to believe that there exists a science of Universals. Their farthest remove from matter is to Mathematics, the science of which the Antients very much esteemed, because they thought mathematical ideas were of easiest abstraction, and therefore proper to disentangle the Mind from Matter, and *teach* it to rise to nobler speculations ; and it is from this use of it that the science has its name. But our modern philosophers seem to think, that Geometry, Arithmetic, and the application of these sciences to body, is the whole of philosophy ; and, I doubt, many of them believe that nothing exists except body, and its attributes.

The style, too, I am afraid, is not of popular relish, any more than the subject ; wanting that spruceness and trimness which is so fashionable at present in writings upon all subjects. Many now-a-days seem to me to read, like Hamlet in the Play, *words, words*, without any consideration of the matter, and to regard dress as the principal quality of a book, as well as of a person. It is but fair to let all

such readers know that they will be disappointed, if they expect to find here what they call *fine language*. From the authors I have studied, I have not learned to cut philosophy into short, smart, sentences, after the manner of Seneca : And I should think my subject disgraced, if I were to treat it in the style of Tacitus, and his modern imitators among the French and British. The reader, therefore, is to expect nothing here but a plain and simple style, neither poetical nor oratorical, nor mixed (absurdly as I think) of both these ; unadorned, therefore, with epithets, antitheses, and poetical descriptions, and without any *ambitious* ornaments of any kind. This style the reader, if he has formed his taste upon some of the fashionable writers of this age, will, I know, think very insipid.

I had once resolved never to publish any thing in this age, upon the subject of philosophy, for the same reason which Varro gave for not publishing on that subject in his age, namely, that the unlearned would not understand him, and the learned would not read him ; ‘for,’ says he, ‘those who are learned in the Greek learning will chuse rather to read what the Greeks have written upon philosophy, than any thing I could write : And, if they have not Greek learning, they will not care to read what, without that learning, is not to be understood *.’ For the sake of my memory, however, I took large notes of what I had read in the antient writers upon philosophy, to which I joined some observations and explanations of my own. And in this manner I had written a great deal before I resolved to publish : But, finding that these notes could be of little use, even to myself, unless they were put in some order, and fair copies made of them, I thought the best amanuensis I could employ for that purpose was a printer ; and, as they may be of some use to those who are disposed to philosophize in a better manner than is usual at present, and to employ their

* Cicero. Academ. Quæst. lib. 1. cap. 2.

their thoughts upon the noblest subjects that can fill the mind of man, I have given them to the public, hoping that every one, who takes the trouble to read them, will at least be convinced, that the philosophers of antiquity have not bestowed so much time and labour upon these high subjects to no purpose.

The authors I have chiefly followed are, Plato and Aristotle, together with the later philosophers of the Alexandrian School, such as, Plotinus, Porphyry, Jamblichus, Ammonius Hermias, and his scholars, Simplicius and Johannes Philoponus, the two best commentators upon Aristotle; likewise Proclus, who was thought to understand the philosophy of Plato so well, that he was dignified with the title of *his successor*. As the writings of these later philosophers are very rare, and themselves but little known, I propose, in a future volume, (if I live to publish another), to give some account of them, and, at the same time, a short history of this philosophy.

I should think myself ungrateful, if I did not acknowledge my obligations to one modern author, of whom I have made much use. It is Dr Cudworth, author of '*The true intellectual System of the Universe*.' He is more learned in the whole antient philosophy, the older as well as the later, than any modern author I know: And the style in which he writes is copious and learned, very different from the fashionable style of this age. The book is at present little known, and hardly read by any body. Before it fell into my hands, I had formed my system, which I was exceedingly pleased to find agreed so well with the Doctor's. And, indeed, it is no wonder that it should, considering that they are both drawn from the same sources. I was particularly pleased that he agreed with me in what I have laid down as a fundamental principle, that body cannot move itself, and, therefore, what moves body must be incorporeal*. He

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* Cudworth, page 888.

has also supported very well my opinion, that there is in every part of nature an active principle operating for a certain end, but without consciousness or knowledge of that end. This is his *plastic nature*, as he calls it; and it was hearing of it that first gave me the curiosity of looking into his book.

There is another modern author by whom I have likewise been assisted, Mr Baxter, the author of the treatise upon the Immortality of the Human Soul. This author is learned in the modern philosophy; nor is he unlearned in the antient. Though I do not agree with him in every particular, as I do with Cudworth, I think his work has a great deal of merit, and is a system of pure Theism, proceeding upon that grand principle above mentioned, that body cannot move itself.

As far as Mr Harris has gone in this metaphysical philosophy, there was nothing further to be done: And, accordingly, I have referred to him for the particular explanation of the several categories or predicaments, and have only made some general observations upon them.

These are the authors by whom I have been assisted in this work. As to the authors who have written in support of Atheism and irreligion, I have taken very little notice of any of them, except one, who lay so much in my way, that I could not have passed him by, without affectation—I mean Mr David Hume, the author of the *Essays, Moral, Political, and Philosophical*. I have, however, such an aversion to controversial writing, that, I believe, I should not have made any particular answer, even to him, but have allowed his impiety to be buried with him, if he himself had been contented with that, and had not, even after death, endeavoured to continue still his vain triumph over religion, having left, by way of legacy to the public, certain works, to be published by his executors, more
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impious, if possible, according to my information, than any that he published during his life *. When an author of so great reputation among certain persons, and whose tenets, I am sorry to say, have got a very fast hold of many, ignorant of antient learning, and knowing nothing of philosophy but what they have learned from some late French and English books—when such an author, I say, that has been so much celebrated and praised, both alive and dead, shows so much zeal in the cause of Atheism, I should have been thought to have betrayed the cause of Theism, if I had not taken particular notice

* Since writing the above, I have seen two specimens of his posthumous impiety; at least, they were put into my hands as written by him, though I have been told since, that his friends deny them to be his; which indeed I am not surpris'd at; but I am convinced that they belong to him, not only from the matter, but the style, which is dry, inanimate, and without the least colouring of classical elegance. One of them is a treatise upon Suicide, which was printed many years ago, but not then published, for reasons that are pretty well known. The other is a Discourse on the mortality of the Soul. In both these, the author throws off the mask of scepticism, and, in the first mentioned, he dogmatically maintains, that a man is at liberty to go out of this world whenever he thinks proper; and, in the other, with as little ceremony, and as positively, maintains, that the human soul is as mortal as the body that it inhabits: For proof of which, his chief argument arises from confounding sensations and ideas, the fundamental principle, as I have observed, of his whole philosophy; for he there asserts, that the mind operates only by the organs of the body, that is, the senses, and that it cannot act but in conjunction with the body: And, indeed, were that true, it would be impossible, as I have said, (p. 200. and 227.) that philosophy could furnish any convincing proof of the separate existence of the soul. And, in general, I observe, that the foundation of all Atheism is a total ignorance of the philosophy of Mind, so as to be unable to distinguish betwixt the operations of Mind in conjunction with body, and its operations by itself. There is a third work of his, not yet printed; at least that I know, but which has been seen in manuscript by several, and which, I have been told, is worse, if possible, than any of the other two, or than any thing he published during his life; for there the being of a God is denied more explicitly than by Spinoza, or any Atheist of modern times, except it be the author of the *Système de la Nature*.

notice of his arguments. At the same time, I know that there is an answer already written to him, which I have read with a great deal of pleasure, where the absurdities of his philosophy are exposed with much pleasantry, and made to appear as ridiculous as they really are : And, though I know that he and his friends have complained much of the style of this answer, it is, I think, without any reason ; for a man, who had insulted so much the religion of his country, and had been so rude and ill-bred as to publish, that no man could be a Christian, unless the whole principles of his understanding were subverted *, was not entitled to be treated even with the regard which Dr Beattie has shewn him. But, as many people, I know, wanted a more serious and philosophical answer to Mr Hume's arguments, though I thought Dr Beattie's answer was all that they deserved ; yet, that nothing might be wanting in such a cause, I have given an answer strictly philosophical, and such as, I think, must satisfy every one who will take the trouble to study and understand it. In this answer, though I have treated his opinions with the greatest freedom, and given them the epithets which they deserve, I have abstained from that illiberal abuse, which no zeal, even in the best cause, can justify.

There are, I know, who think that such authors are best treated with contempt and neglect, and that, to answer them, may do more ill than good : But, when their writings are read and admired by persons of rank and condition—when their opinions are adopted by men of science, it is time for every good man, and lover of his country, to take the alarm. I think it is impossible that any man of common sense can really believe, whatever he may profess, that religion, as well as government, is not absolutely necessary for men living in society. Now, it is well known, that opinions, as well as manners and customs, descend from the better sort of people, in every country, to the lower sort, and so become universally prevalent. To the disbelief, there-

* Essay on Miracles, towards the end.

therefore, and neglect of religion, among persons of high rank, in Britain, may, I think, fairly be ascribed that irreligion, and the consequent corruption of manners, which distinguish more, I am afraid, than any thing else, the commonality of this island from the same rank of men in any other nation in Europe, and which, if not soon checked, must end in the destruction of the nation.

It might have been expected that I should have taken more particular notice of the arguments that have been used against natural religion, by some other writers, both French and British : But I hope I have furnished principles sufficient to answer them all. And, besides, I must confess the truth, that, though I have looked a little into those authors, their style, as well as their matter, is so different from that of the authors I am accustomed to read, that I had not patience to read them with the attention which is necessary to make a particular answer to them. Another reason is, that, as this work is intended more for posterity, than the present age, I did not think proper to mix with it a controversy with authors, whose writings, if I may venture to prophesy, will be quite forgotten in not many years, however they may flatter themselves with not only the continuance, but the increase of their literary fame.

The fashionable reader, accustomed to a fair and neat margin, not sullied by references and quotations, will be much disgusted by seeing the bottom of my page so loaded with authorities from learned authors ; and he will particularly be offended with the pedantry of my Greek quotations, in which, I own, I abound ; because they not only serve for authorities, in support of what I advance, but express my meaning much better than I can do in English. What others can do in philosophy, without the help of learning, by the force of genius merely, I cannot tell : For my own part, I am not ashamed to make the same confession which Cicero made, ‘ That, distrusting my natu-

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'ral abilities, I have sought the assistance of learning †,' and of the same learning to which Cicero applied, I mean the Greek learning. Now, the Greek learning is not to be understood without the Greek language; and I should deceive my reader, if I did not let him know, that, without at least a competent knowledge of that language, he can never understand the Greek philosophy. This, I know, will be a very disagreeable truth to the generality of my readers, who may think that, by the superiority of their genius, joined with the study of French, English, or, perhaps, Latin books, they may become philosophers; but, as I do not write to flatter vanity and indolence, I must be forgiven to tell them, that, if they are neither Greek scholars, nor will take the trouble of becoming such, they ought to give over thoughts of philosophy. If they are curious about the history of nature, the modern discoveries will furnish them a great deal of that kind, more than was known to the ancients; and they may be very good geometers, astronomers, and learned in mechanics, without knowing a word of either Greek or Latin: But, in philosophy, I have never known any man succeed who was not a scholar.

I hope, therefore, that this work will have the effect of making those, who take the trouble to read it, and who are not Greek scholars, desire, at least, to be such, and will persuade those who have already learned the language of the Greeks, to apply it to the study of their philosophy; or, if it should have neither of these effects, it may, at least, serve to diminish vanity, and to hinder men from thinking themselves philosophers, because they may happen to be learned in natural history, experimental men, mathematicians, or astronomers.

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* Pro Lucio Muraena, cap. 30.

P R E F A C E.

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Upon the whole, however ill this work may be generally received, I have no reason to complain of the ingratitude of the public, as I frankly own that it was chiefly for my own sake that I composed it,

Condo et compono quae mox depromere possum ;

I lay up, like the bee, for the winter——of old age, which is coming fast upon me, when I could not have made such a collection as this ; but, even then, I hope to be able to enjoy it, and to spend the last years of my life in the study, of all others the most befitting a man who is soon to enter into the world of spirits, I mean, the contemplation of the GREAT SPIRIT, and of the Wisdom, Goodness, and Power, manifested in his Works.

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INTRODUCTION.

Upon the whole, however ill this work may be generally received, I have no reason to complain of the ingratitude of the public, as I frankly own that it was chiefly for my own sake that I composed it.

Condo et compere dare non deservire possum.

I lay up like the bee, for the winter—of old age, which is coming, I am sensible, when I could not have made such a collection as this; but, even then, I hope to be able to enjoy it, and to spend the last years of my life in the study of all others the most desirable; a man who is born to enter into the world of spirits, I mean, the contemplation of the Great Spirit, and of the Wisdom, Goodness, and Power, manifested in his Works.

INTRODUCTION

I N T R O D U C T I O N.

WHAT I propose, in this Work, is to revive antient Theism, particularly the theism of Plato and Aristotle, which, like the greatest part of antient philosophy, is almost intirely lost in this age. The consequence of this is, that our modern philosophers, even such of them as are theists, make their system of Nature much too mechanical ; for they *physiologise* without Mind ; and, though they allow that Mind was necessary at first to produce this universe, and set it a-going, they think it may go on without Mind, by the powers of Matter and Mechanism merely : Whereas the antients thought, that the operations of Nature could no more go on without the constant and unremitting agency of Mind, than an universe could have been at first produced without Mind.

Modern theism may be divided into two kinds ; the first is that of Des Cartes, the French philosopher. He admits the existence of an incorporeal Deity altogether separated from Matter, whom he makes the author of the universe, and all things in it, and bestows on him all those perfections of Goodness, Wisdom, and Intelligencè, which are commonly ascribed to him. This is his *theology* : But his *physiology* is absolute materialism ; for, rejecting all final causes, and so excluding Intelligence and design from the system of the universe, he derives every thing from Matter once set in motion by the Deity, by which he accounts not only for the formation and motion of the celestial bodies, but the organization and successive generation of animals

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and plants, and even the instinct of brutes, by which they preserve the individuals, and continue the race in so wonderful a manner *.

The other system of Modern theism is that of Sir Isaac Newton. His philosophy is not so comprehensive as the philosophy of Des Cartes ; for he does not meddle with plants or animals here on earth, except that he has said, that sensation, and the spontaneous movement of animals, are produced by a *subtile spirit* † : But he has nowhere said, nor do I believe he thought, that the bodies of plants or animals are the work of mere matter and mechanism. It is with the stars chiefly that his philosophy is conversant ; and, with respect to them, he admits that they were formed by Almighty Power and Wisdom, and also put in motion ; but, being once set agoing, he maintains that they go on of themselves by the power of matter and mechanism merely, without the agency of Mind ‡.

The antient system of theism, which I here present to the reader, is very different from either of those two above mentioned. It proceeds upon this principle, that Mind is the author of all the motion in the universe, which, though it may be continued and propagated by the impulse of Body upon Body, must have originated from Mind : So that all Bodies are moved by Mind, either mediately or immediately ; and, therefore, when Body is moved, and it cannot be shown to be moved by the impulse of another Body, it must necessarily be supposed to be moved immediately and directly by Mind. The consequence of this principle is, that, as the motions of animals, vegetables, and various other motions upon earth, cannot be accounted for from any material

* See what I have further said concerning Des Cartes's philosophy in the Dissertation annexed to this volume.

† *Principia*, in *fine*.

‡ See also, concerning this philosophy, the Dissertation annexed.

terial and mechanical cause, they must be supposed to be produced by Mind. In the heavens, these philosophers proceeded in the same manner as on earth : And, as the motions of the celestial bodies cannot be accounted for by any material and mechanical causes, they maintained, that they are moved directly and immediately by Mind, without having recourse to hypotheses of gravitating and projectile forces.

This antient system has this advantage over the Newtonian, that it is more universal ; so universal, that it is well entitled to the name of *philosophy*, and the *first philosophy*, as it explains the principle of all motion, and all production in the heavens and in the earth.

Nor are we to imagine that, because the antients made Mind the great agent in Nature, and an essential part of the system of Nature, they did therefore confound *physiology* and *theology* ; but, on the contrary, they distinguished, I think properly, betwixt the two, and set the proper bounds to each of them, making *theology* to be the doctrine of Mind separated from all Body, while *physiology* explains the operation of Mind in Body, by which all the natural operations are produced, either immediately, or by the intervention of other bodies ; for it cannot be denied that there is a great deal of *mechanism* in Nature, that is, motion produced by the action of Body upon Body.

With respect to Experimental Philosophy, as it is called, I am very far from denying the use of it ; but I would have the gentlemen who value themselves so much upon this kind of *manual* philosophy, to distinguish betwixt the *phaenomena* and the *principles* of Nature, and not imagine that the latter, as well as the former, are objects of sense, to be discovered by chymical analysis, or seen through a microscope. They should consider themselves as the historians of Nature, who, by great attention, and minute observation, investigate facts which escape

the vulgar, and may be called the *anecdotes*, or *secret history*, of *Nature*. But history and philosophy are two things very different ; though, I admit, that, without the knowledge of facts, it is impossible to form any system of natural philosophy that is not a mere dream, being no other than the imaginations of men, in place of the wisdom of God. But nothing deserves the name of philosophy except what explains the causes and principles of things ; and, therefore, as the material world is all in motion, and every thing in it produced and preserved by motion, it is the chief business of natural philosophy to show what is the principle of this motion, by which all the operations of nature are carried on. This principle is, according to my philosophy, *Mind*, which, operating in Body, and directing its movements, is what I call *Nature*. To distinguish the different kinds of this Mind, according to its different operations in bodies organized and unorganized, and to show how those operations differ from one another, belongs to the *philosophy of Nature*. And, as it is impossible to conceive that Mind can do any thing without an end or purpose, being either itself intelligent, or directed by intelligence, it is a principal part of this science, and, I think, the most delightful part of it, to investigate final causes, and to show, if possible, of what use every thing in the system is, and how conducive to the harmony and beauty of the whole. But since, as I have said, Mind not only moves Body immediately, but by the intervention of other bodies, that is, by mechanism, it belongs to the natural philosopher to discover by what laws matter thus operates upon matter ; and with what force, and in what direction, bodies impel one another ; and what relation the time bodies are in motion, their velocity, and the space they go through, have to one another. This is discovered by a proper application of geometry to the motion of bodies ; and, in this way, *mathematics* are of singular use, not only in the arts of life, but in the philosophy of Nature. But, if a mathematician goes farther, and inquires concerning the principle of motion, and the operations of Mind in Body, or separated from Body, he goes out of his science, and incroaches upon the province of the natural philosopher,

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pher, or the metaphysician. To the *metaphysician* it belongs, as I have said, to treat of Mind separate from Body, or, at least, operating separately. Of this latter kind, there is one that we know most intimately, which, though not separated from body at present, is, by its nature, separable, and does actually operate separately, even in this state of its existence—I mean the human soul; the study of which, therefore, is of the greatest importance; not only in respect of religion and morality, but of *theology* or the *first philosophy*; as it is only by the diligent study of it we can ever attain to any knowledge of the Supreme Mind.

And here we may observe by what regular steps the antients ascended to that Supreme Mind, the contemplation of which is the end of all philosophy. They began with that lowest Mind, or Motive Principle, which is in all physical bodies, unorganized as well as organized. From thence they proceeded to the Motive Principle in the vegetable and the animal; and from the animal or sensitive Nature, they ascended to the rational and intellectual Nature of man; and, by studying this, the divine part, in our nature, they attained, as far as human capacity could attain, to the knowledge of what is most exalted in the universe, and at the top of the pyramid. Thus, proceeding regularly through Physics, and never losing sight of Mind, they came, at last, in the natural order of things, to Metaphysics, and that part of it which is the summit of philosophy, and of all human knowledge, I mean Theology. The progress of the moderns in these speculations is not so regular; for, without going through Physics, we endeavour to rise at once to the highest regions of Metaphysics, or, if we take Physics in our way, it is a kind of Physics in which Mind is almost wholly laid aside, and Matter and Mechanism substituted in its place. And it is this preposterous way of studying Metaphysics which has produced such wild and extravagant notions, and brought so great a disgrace upon the noblest of all sciences.

The

The reader who is not acquainted with antient philosophy, and has not comprehensive views of Nature, will be surpris'd that I should call by the name of *Mind*, that principle of motion, which runs through all Nature, and is in all bodies, unorganized as well as organized. He will readily allow that it is Mind that moves our bodies: He will not, perhaps, dispute with me, that the brutes have Minds of a certain kind: The motive principle in the vegetable, if he do not maintain its movements to be altogether material and mechanical, he will call *Life*, not *Mind*. As to the motion in unorganized bodies, he will believe, if he be a materialist, that matter has the power of moving itself; or, supposing that he is a theist, and believes that the Deity is the origin of all motion, he will have no idea that Mind is the immediate cause of the movement of those inanimate bodies, as they are commonly called. But, as all things in this universe either move or are moved, what moves I have called *Mind*, what is moved, I call *Body*; and thus, I have made a twofold division of the university of things, which is better, I think, than a threefold division, into *Mind*, *Life*, and *Body*; and I have given a definition of each of the members of my division perfectly agreeable to the nature of things,

What I deliver here as the theism of Plato and Aristotle, is much more antient than those philosophers, and, for any thing I know, the most antient philosophy in the world. It undoubtedly came to them from the school of Pythagoras; but it certainly was not invented by him, but brought by him from Egypt. There it took its rise among the colleges of priests, men sequestered from the world, and consecrated to religion and learning, who must have made an extraordinary progress in philosophy, and every other science, by uninterrupted study, continued from father to son, during a long succession of ages, far exceeding, in length of time, the period, not only of arts and sciences, but of civilization, in any part of Europe—That, not only philosophy, but all arts and sciences, came originally from Egypt into Europe, even

ven the necessary arts of life, is a fact well known to those who are learned in the history of learning ; and, particularly, this universal philosophy was first imported into Greece, under the veil of mystery, by Orpheus, and other mystagogues, and revealed only to those who were thought worthy of being initiated into their solemn mysteries, such as the Eleusinian and Samothracian. It was delivered more plainly, and, I believe, more fully, by Pythagoras, and cultivated in colleges instituted by him in *Magna Graecia*, upon the model, no doubt, of the colleges of priests in Egypt. After the destruction and dispersion of these Pythagorean colleges in Italy, some fragments of this philosophy, like scattered planks of a shipwreck, were collected and preserved by Plato and Aristotle, and their commentators of later times ; some of whom were particularly industrious in collecting the few remains that were then to be found of the Pythagorean school. All the merit, therefore, that I pretend to, is that of having studied diligently what is yet to be found of this most antient philosophy, the most valuable remains of antiquity, according to my judgment, that have escaped the ravages of time and barbarity.

Metaphysics, I know, are, at present, in great disrepute among men of sense, from the use that, of late years, has been made of them. Young men, who get a little smattering of this science, are apt to abuse it very much, disputing against every thing, even the clearest truths, and, like puppies, (to use an expression of Plato,) pulling and tearing whatever they can lay hold of. Some elderly men, too, of little learning, and much vanity, affect to distinguish themselves by singular opinions, and refuting all vulgar notions ; among which they reckon the belief in God and his providence. But the metaphysics I here deliver are of a very different kind, and which, therefore, I have entitled *Antient Metaphysics*, where, it is hoped, the reader will find nothing adverse, either to natural or revealed religion : But, on the contrary, I trust that, from those antient masters, I have learned the purest theology, and shall,

shall, upon their principles, be able to establish, not only the great truths of natural religion, but some of the fundamental doctrines of Christianity.

The work will be divided into *three* parts. The *first* of which, contained in this volume, will explain the subject of Metaphysics, its nature, and extent, and will lay down the general principles of the science.

In the *second* part, I propose to treat of Man ; and, through Man, to proceed to God and Nature ; which will be the subject of my *third* and *last* part.

In the *second* part, I propose to consider Man in a more extensive view than he has hitherto been considered by writers upon morals and politics, not only as a species of animal by himself, but as a part of the system of the universe, and containing in himself a type, as it were, or model of the whole system ; for, it was an antient notion, and which, I think, I have shown to be true, even in this part of my work, ' That man is, in himself, a little world, being composed, not only of ' the four elements, but of the vegetable, the animal, and the intellectual life.' And, in that part of my work, I hope to make it appear, that what I have advanced in another work is true, ' That it would ' not be according to the order of Nature, if these *three* should operate ' at once in Man, but that there must necessarily be a progress from ' the *vegetable* to the *animal*, and from the *animal* to the *intellectual*, ' not only in the *individual*, but in the *species*.'

The first part of my work, contained in this volume, is divided into five Books. The first gives an account of the nature of the science, explains what Body, Mind, and Motion, are, and gives the definitions of several other terms used in this work.

In

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ix

In the *second* book, I treat of the constituting and elementary principles of this universe ; or, in other words, of the Efficient and Material Causes. And, under this head, I have spoken very largely of Mind, the prime efficient cause of every thing in the universe.

The subject of the *third* book is the Categories, or the Universal Formal Causes of all things in Nature.

The *fourth* book treats of those Adjuncts of Nature, Time, Space, and Place.

The *fifth* book treats of the principles of Science and Certainty, and defends them against the cavils of sophists and sceptics, both ancient and modern.

I intended to have added a sixth book, containing the History of this Philosophy, and giving some account of the authors who have treated of it : But this I reserve for the second part of my work ; and, in place of it, I have subjoined, by way of Appendix, a Dissertation upon the Principles of the Newtonian Philosophy.

6

A N T I E N T

In the second part, I treat of the philosophy and elementary prin-
ciples of the human mind, as far as they are concerned with the
of Cause. I have treated this part of the subject in a very simple
the pages of the first volume of the present edition.

The third part of the work, which is the subject of the Universal
Principles of the Human Mind, is a continuation of the
The fourth book, which is the subject of the Human Mind, is a
and I have

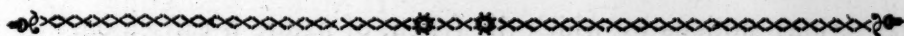
The fifth book, which is the subject of the Principles of Science and Certainty, and
defends them against the attacks of scepticism and scepticism, both an-
cient and modern.

I intended to have added a fifth book, containing the History of this
Philosophy, and giving an account of the authors who have treated
of it; but this I reserve for the second part of my work; and, in place
of it, I have added, by way of appendix, a Dissertation upon the
Principles of the Human Mind.

A N T I E N T

The first part of the work, which is the subject of the Universal
Principles of the Human Mind, is a continuation of the
The fourth book, which is the subject of the Human Mind, is a
and I have

A N T I E N T
M E T A P H Y S I C S.



B O O K I.

C H A P. I.

Of the subject of Metaphysics—All Things in Nature either Body or Mind—Subject of Physics is Body joined with Mind—Subject of Metaphysics is Mind by itself.

METAPHYSICS is a science so abstruse, and so remote from common apprehension, that even the subject of it is not easily understood by those who are not accustomed to abstract thinking. And, accordingly, I observe, that Aristotle, in more than one passage of his metaphysics, has been at great pains to explain what his subject is, and, for that purpose, has made several nice distinctions, of which I will not take notice at present; but will set out with one which is obvious, and made by every one; I mean the distinction betwixt *body* and *mind*; and which, at the same time, is most comprehensive; for every thing in nature is either *body* or *mind*, or their accidents.

cidents*. All the subjects of human knowledge, however various, may be referred to one or other of these heads.

Mind exists either by itself, or joined with *body*: For I differ so much in opinion from those philosophers, who think there is nothing else existing but *body*, that I hold there is not in the whole universe, as far as our knowledge extends, any *body* without *mind*. *Mind*, therefore, according to the philosophy I have been taught, pervades the universe, mixes with, and informs every body in it, and produces all the various motions by which the system of nature is carried on.

————— Deum namque ire per omnes
Terrasque, tractusque maris, coelumque profundum.

And again,

————— totamque, infusa per artus,
Mens agitat molem, et magno se corpore miscet. VIRG.

The Divinity we conceive to be pure energy; and it is by acting and energising that every thing in nature partakes more or less of divinity. Nothing, therefore, is dead or senseless; but all full of life and motion.

It was in this way that the great philosophers of antiquity divided the universality of things; for all things existing, they said, were

* I use the word *accident* in the most general sense, to denote every quality, property, action, or operation of any *substance*, whether essential to it, or what is commonly called *accidental*. The meaning of the word is much better expressed by the Greek word *συμβεβηκός*, denoting every thing that accompanies, or goes along with *substance*, than by the Latin word *accidens*, from which ours is derived.

This division of all things into *body* and *mind* is given by Plato in the *Epinomis*, page 1010. *editio Ficini*, where he adds, that there is no third thing distinct from either, all things being either *body* or *mind*.

were either separated from *matter*, or united with it *. And, according to this division of things, they divided *speculative philosophy*, which, they said, was either *physics*, the subject whereof were *things* inseparable from *matter*, both as they existed in nature, and according to our conception of them ;—or *metaphysics*, the subject of which was, what is entirely separated from *matter*, both in its own nature, and according to our conception of it †.

Betwixt these they placed a third science, viz. Mathematics ; the subject of which was, what did not exist separated from *matter* in its own nature, but was, by the act of our minds, abstracted from *matter*, and considered as existing separately : So that it was in one respect separated from *matter*, in another not separated ; and, therefore, was considered by the antients as a science lying betwixt the other two, and participating in some sort of each. Of this kind they considered *number* and *figure* to be ; the first, being the subject of arithmetic, the second of geometry ‡.

Mind,

* The former of these Aristotle calls χωριστα, or ἀνὸν τῆς ὕλης. The other he calls ἀχωριστα, or μετὰ τῆς ὕλης. Arist. metaphys. lib. 6. chap. 1.

† Aristotle, *ibid.* Where he says, that the subjects of physics are, both by their nature, and by our conceptions of them, so much joined with *matter*, that we cannot define them, or give any account of them without it. For, says he, we cannot tell what bone, flesh, a root, a leaf, bark, or, in general, what an animal or vegetable is, without taking into our consideration the *matter* of which they are composed, as well as the *form*.

‡ See Aristotle in the passage above quoted. See also Ammonius Hermæus's introduction to his commentary upon the *five words* of Porphyry, where he has explained this whole matter very fully and distinctly. Among other things, he tells us, that the mind, contemplating a circle, for example, of wood, or brass, takes off, as it were, the *form* of it, without the *matter*, as wax takes the impression of a seal :

Θεωροῦμενοι κύκλον ξυλινόν καὶ χαλκόν, καὶ λιθινόν, ἀνιμαζομένη τοῦ εἶδους αὐτοῦ τοῦ κυκλοῦ ἐν τῇ διανοίᾳ τῇ ἡμετέρῃ καὶ ἔχουσι παρ' ἑαυτοῖς διχῶς τῆς ὕλης, ὥσπερ ἐκ κηρὸς λαβοῖσι τὸ ἐκτύπωμα τοῦ δακτύλου,

λίου,

Mind, therefore, pure *mind*, intirely separate from *body* and its attributes, is the proper subject of the science I call *metaphysics*. And here we may observe the reason of the name given by Aristotle to the books in which he treats of this science; these he calls *μετα τα φυσικα*, or, as we have translated it, *metaphysics*, importing, that the subject of it is something transcendent, or beyond *physics*, and that the study of it should come in order after *physics*. For, it is evident, that, as in this state of our existence, all our knowledge originates from our senses, we can have no idea of *pure mind*, but by observing its operations in *body*. The only foundation, therefore, upon which *metaphysics* can properly rest, is *physics*; the subject of which, as I have said, is a compound of *body* and *mind*.

Those,

λιον, μη προσλαβων τι της υλης. And, with respect to mathematics, he says, they are very properly placed betwixt *material* or physical entities, and *immaterial* or *divine*, as he calls them, because it is thro' them that we are to pass from the former to the latter; and, from that use of them, they are called, he says, *μαθηματα*, as it is by them we are taught to ascend from material things to immaterial and divine: *Δια τουτο γαρ και μαθηματα λεγονται, οτι δι ταυτα μειδανοντας και ιδιοθεντας ιενν ασωματης, αναγιθαι επι τα θεα*. And he gives us, upon this occasion, a very fine quotation from Plotinus, who says, that the youth should be taught mathematics, in order to accustom them to the contemplation of immaterial natures; for, if we were to pass immediately from physics to metaphysics or theology, we should be dazzled and blinded, like those who come at once out of a dark house into a great light. We ought, therefore, to stay some time in a place moderately lighted, and from thence pass into the great light. See a great deal said to the same purpose by Proclus in his commentary upon the first book of Euclid. This I would have observed by our modern philosophers, who seem to value geometry too much for its own sake; or, if they make any use of it, it is only by applying it to *body*. And, indeed, the whole of our natural philosophy at present appears to be nothing more than the observation of the phaenomena of nature, which I call *natural history*, not philosophy; or the application of geometry to the motion of *bodies*. But, so far from making the use the antients made of it, to elevate the mind to the contemplation of superior natures, I suspect many of those philosophers do not believe that any such natures exist, and are so much conversant with *extension* and its properties, as to imagine that nothing exists which is not extended.

Those, therefore, who ridicule the noblest of all sciences, under the name of *metaphysic*, not only do not know the nature of the science, but appear to me, not to understand even the title of Aristotle's books which treat of it, but to imagine that it has some connection with what we call in English *physic*.

It is called by Aristotle the *first philosophy*; because, though it be last in the order of human knowledge, on account of the weakness of our *mind*, and its necessary progress from objects of sense to those of intellect, it is first in the order of nature, as treating of what is highest in nature *, and comprehending, as we shall afterwards see, the principles of nature and of all arts and sciences.

The proper subject, then, of *metaphysics* is *mind, pure and separate from all matter*. But there are also other things comprehended under this science, and which shall be explained in the sequel. For, as I observed in the beginning of this chapter, it is a science of which even the subject is not easily, or at once, to be explained.

* Aristot. metaphys. lib. 6. chap. 1.

C H A P. II.

Definition of Body and Mind—Definitions of Body given by modern Philosophers not proper—Definitions here given agree with those given by Plato and Aristotle—Objections to these Definitions answered—Impropriety of the English Language with respect to the Use of the Word Move.—Inconsistence of Mr Locke upon the Subject of Mind and Body.

IN the preceeding Chapter, I supposed that the difference of *body* and *mind*, and the nature of each, was known to the reader; but *metaphysics*, or the first philosophy, supposes nothing to be known, nor assumes any thing from common sense or apprehension, but defines and demonstrates every thing, as far as it is capable of demonstration; we must therefore try whether we cannot give some definition of *body* and *mind*, taken from the nature of things as existing—for it is to be considered that metaphysics is not, like mathematics, a science of the ideas or notions of our *mind*, but of things as they exist in *nature*.

This is the more necessary, that there has not been, in my opinion, any good definition yet given of *body* by our modern philosophers; and, as there are but two things in nature, *body* and *mind*, so that, what is not *body* is *mind*, it is evident that, without the knowledge of *body*, we cannot know what *mind* is. The vulgar, and most obvious definition is manifestly imperfect, viz. *That which affects our senses*. For, though whatever does so, is undoubtedly *body*, there may be, and certainly is *body*, which is not perceived by any of our senses. Neither is the definition given by some of our philosophers, by which *body* is made to be that which has three dimensions, *length*, *breadth*, and *depth*, any better; for, though that be a very proper definition given by Euclid of a solid, it is not at all a proper definition of *body*; for these three dimensions are only the boundaries of *body*, of which boun-

boundaries geometry is the science, not *body* itself, which is what is contained within those boundaries. The same objection lies against the definition which makes *body* to be the same with *extension*; for a thing is said to be *extended*, that consists of parts which are co-existent and continuous, that is, have a common boundary; and the three dimensions are but extension differently considered, according to the different position of the parts, with respect to one another, and to us. For extension, considered as situated before or behind, is what we call *length*; considered as lying to the right or left of us, it is *breadth*; and considered as going up or down, it is *depth*. Besides, *space* is extended as well as *body*. The definition, therefore, is too comprehensive. But, on the other hand, the definition is not comprehensive enough, by which *body* is described 'to be that which resists, and is impenetrable.' For, according to the opinion of certain philosophers, there are some fluids so subtle as to penetrate all bodies. We must therefore try whether we can find a definition of *body* more comprehensive, and more adapted to the nature of things as they actually exist, which, as I have said, are the subject of *metaphysics*. It ought also to be such, as to have a relation to *mind*. For, as the whole universe consists of *body* and *mind*, and as these two are wonderfully mixed together, in every part of nature, and in the material world, according to my apprehension, never separated, it is manifest that they must have a natural connection and relation one to another. Now, there is, in all the parts of the material and visible world, a perpetual *motion*: For the celestial bodies move constantly in one respect or another; and all here below is in a continual vicissitude of generation and corruption, which cannot be without *motion*. Now, where there is *motion*, there must be there something that *moves*.—What is *moved*, I call *body*;—What *moves*, I call *mind*. And this definition takes in the opinion of all the philosophers who believe that there is such a thing in nature as *mind* distinct from *body*: For these all agree that *mind* is either mediately or immediately the cause of all *motion*. And, as there is nothing in nature but *body* and *mind*, that which is *moved* must necessarily be *body*.

For

For explaining this definition, it is proper to observe, that, under the term, *is moved*, I include what *is moveable*, or capable of *being moved* *. For, though all bodies which fall under our observation are in some kind of *motion* or another, at least, have a tendency to *move*, there is nothing to hinder us to conceive *body* perfectly at rest. And we cannot tell but that somewhere in the universe *body* may be in that state. It is further to be observed, that, by *motion*, I here mean only that kind of *motion* which consists of change of place or situation, and which, as I shall afterwards show, is peculiar to *body*. Again, under *mind*, in this definition, I include, *first*, The rational and intellectual; *2dly*, The animal life; *3dly*, That principle in the vegetable, by which it is nourished, grows, and produces its like, and which, therefore, is commonly called the *vegetable life*; and, *4thly*, That *motive principle* which I understand to be in all bodies, even such as are thought to be inanimate †.

This

* This is the sense of the Greek word κίνητος, and of all the verbals of that termination, such as, ποιητος, οικοδομητος, πρακτος, &c.; all which denote *passive capacity*; whereas the verbals in ικος, such as, κινητικος, ποιητικος &c. denote *active capacity*. See Aristotle, Metaph. lib. 13. cap. 9. where, unless we are able to make the distinction betwixt κίνητος, κινούμενος, κινούμενον, κίνησις, and κινητικον, it is impossible to understand a very fine and most subtle theory concerning motion. All these differences cannot be expressed without much circumlocution in English, which is not a language like the Greek, the work of philosophers, who made all those nice distinctions, but, like the other languages of Europe, a barbarous dialect, and a corruption of a better language. See what I have further said upon this subject in the 2d vol. of the Or. of Lang. p. 186. The distinctions which I have here made, and which are there likewise made, may appear no better than *difficiles nugae* to most readers; but they are necessary, not only for understanding the Greek language, if that be of any value, but for understanding the nature of things.

† The Greek word ψυχη denotes the three first kinds I have mentioned, which are not expressed by any one word that I know in English; for the word *mind*, that I have used to express them, denotes, in common use, only the *rational mind*, or *soul*, as it is otherwise called. The fourth kind that I have mentioned, viz. the

This is the distinction betwixt *body* and *mind* made by Plato in his tenth book of *Laws*, (p. 951. *et seq. editio Ficini*). And, as to Aristotle, he has made *motion* so essential to *body*, that, by it, he has both defined and divided *body*: For he has defined a *physical body* (for so he calls what I call *simple body*, in opposition to *υλη* or *matter*, which I shall speak of afterwards,) to be “that which has the principle of motion in itself*.” Now, according to Aristotle, *motion* is in that which *is moved*, not that which *moves*†. And, as he has thus defined *body* by *motion*, so he has divided it in the same manner; for, says he, some bodies move in a circle, that is, by a motion revolving into itself, which, being the most excellent kind of motion, belongs to the most excellent bodies, viz. the celestial: Others move in a straight line, either towards the centre, or from it. And, *lastly*, others have a motion mixed of the circular and rectineal; such is the motion of animals. And, as these are all the kinds of motion possible, so these are all the different bodies that can exist‡. This is Aristotle’s notion of *body*; and, as to the principle of motion, or *moving principle*, which he supposes to be in all bodies, it is what he calls *nature*§; and, that he believed *nature* to be a principle quite different from *body*, is evident, both from his books of *Physics* and *Metaphysics*. And indeed, the main design of his whole philosophy of nature is, to prove, that the first principle of motion in the universe is an immaterial principle, eternal, immoveable, and unchangeable; for with this he concludes both his *Physics* and *Metaphysics*.

And here the reader may perceive the reason why I have said, that *body* does not exist by itself, but always united with *mind*. For, as all *body*, as far as we know, is in *motion*, or has a tendency to move,

B

and,

the *motive principle* in all bodies, is not commonly in Greek called *ψυχη*. But Aristotle, in a passage which I shall afterwards quote, says that it is *ωταν ψυχη*.

* *Physic. lib. 2. cap. 1. De Coelo. lib. 1. cap. 2.*

† *Physic. lib. 3. cap. 2.*

‡ *Lib. 1. De Coelo, cap. 2.*

§ *Physic. lib. 2. cap. 1.* He makes *nature* also to be the principle of *rest* in bodies by which I suppose he means, that those bodies which he calls *heavy*, that is, which move toward the centre of the earth, would *rest* if they were there

and, as there can be no motion without a moving power, which I call *mind*, there cannot, consequently, be any *body* without *mind*.

To these definitions I have given of *body* and *mind*, it may be objected, that they only contain a property of each; for it still remains to be inquired, What *body* is, which is thus *moved*? What *mind* is, which thus *moves*?

But to this I answer, that it must always be remembered, that metaphysics is the science of *things*, not of *ideas*. Now, with respect to our *ideas*, which are the creatures of our own minds, being formed by that operation of the mind called *abstraction*, we can give proper definitions, explaining the very essence of the thing; and of this kind are the definitions in mathematics. But, of the works of God, we know not the essence or constituent principles; we therefore cannot define any natural substance, otherways than by mentioning some distinguishing quality or qualities, common to every individual of the kind. Thus, in defining an animal, vegetable, or mineral, we can do nothing more than specify certain principal qualities of it; but what is the essence of it, and that constituent principle from which all these qualities result, is beyond the power of the human mind, in its present state, to discover*.

Now, these definitions of *body* and *mind* express that quality of each which is most conspicuous, both to sense and reason; for it is that quality of each by which the whole business of nature is carried on, above,
below,

* See what I have further said upon this subject, Vol. I. of the Origin of Language, p. 139. in the note, second edition.

Sir Isaac Newton, in the Scholium Generale, at the end of his Principia, says, that we have no knowledge of the essence or intimate nature of any substance, not even corporeal substances. 'Quid sit rei alicujus substantia minime cognoscimus. — Intimas (corporum) substantias nullo sensu, nulla actione reflexa, cognoscimus, et multo minus ideam habemus substantiae Dei. — Hunc cognoscimus solummodo per proprietates suas et attributa,' &c. And in that way only we know his works.

below, and round about us. They also mark that necessary connection which there is, and must be, in this universe, betwixt the two: For, as there is something that *is moved*, there must of necessity be something that *moves*; and this I call *mind*, which is the author of all motion, being that which moves all bodies, either immediately, or mediately by the intervention of other bodies; that is, by what we call *mechanism*. And, in this manner, motion is carried on, without ceasing, through the universe.

Before I conclude this chapter, I cannot help taking notice of a very great impropriety of speech which has crept into the English language, (even the language of philosophers,) by which we confound the *power* that *moves* the body, with the *thing* that *is moved*: For we say, that the body, which only is *moved*, *moves*; confounding, in this way, not only the grammatical signification of the words, but the real distinction of things; and a distinction of no less importance to philosophy and just thinking, than that of *body* and *mind*. In languages more perfect, and of more accurate expression, such as the Greek and Latin, this distinction is always preserved: For *κίνησις* and *κίνησις* in Greek, and *movet* and *movetur* in Latin, signify things as different as *action* and *passion*. Now, as an impropriety of *expression* leads naturally to an impropriety of *thinking*, such confusion of the signification of words ought carefully to be avoided, especially in an age, when there is a visible tendency, in our philosophy, to confound *body* and *mind*, and to make every thing *material*.

The definition that I have given of *body*, agrees very well with that *vis inertiae* which, by our modern philosophers, is held to be of the essence of *matter*, and with that first law of motion laid down by the Newtonian philosophers, 'That *body* is, by its nature, merely *passive*,' so as to be equally incapable of beginning *motion*, when it rests, or stopping it when it is once begun: For the one is an exertion of *activity* as well as the other. But it is not sufficient to define *body* by

passivity merely, without expressing of *what* it is passive : And, as *passion* and *action* are co-relatives, which cannot exist the one without the other, we cannot perfectly understand the definition of *body* without taking *mind* likewise into our consideration. And not only have the Newtonians given this true account of the nature of *body*, but also Mr Locke, in his Essay on the Human Understanding, has expressly said, ‘*That matter cannot move itself* ;’ (Lib. 4. cap. 10. § 10). And again, ‘*That active power is the proper attribute of spirit, passive power, of matter* ;’ (Lib. 2. cap. 23. § 28.) This is true and genuine *theism* ; whereas, to maintain that *matter* has any *active* power, is downright *atheism*, or, what is the same thing, *materialism*. For, if any the least particle of matter can move itself, the whole system of the material world may do so. Mr Locke does not appear to be aware of this consequence, and plainly forgets himself, when he says, ‘*That there is no contradiction in body thinking ; and that it may be so modified as to have that faculty* ;’ (Ibid. lib. 4. cap. 3. § 6.) But there is a manifest contradiction, *that the same thing should, by its nature, have an active power, and should not have an active power* : Nor are there any two things more opposite than *body* and *mind* ; for they are as opposite as *affirmation* and *negation*. But it is no wonder, that a philosopher, who, like Mr Locke, sets out with confounding the operations of the *mind* through the *body*, and with the assistance of the organs of the *body*, and its operations by itself, I mean *sensations* and *ideas*, should, on some occasions, forget the distinction between *body* and *mind* * : But, from the definitions here given of them, I hope they will appear, not only different and distinct, but of natures so opposite that they cannot, like other things in nature, run into one another, but must forever remain perfectly distinguished from one another.

C H A P.

* See what I have further said upon this subject, in a note upon page 93. of the second edition of the first volume of the Origin and Progress of Language.

C H A P. III.

Of Motion—Things preparatory to the Definition of Motion—Two Definitions of it given by Aristotle—One of them better than the other—Not Defined by Modern Philosophers,—Nor by Plato—Aristotle's Division of Motion—Plato's Division different—Compared with that of Aristotle's, both as to Matter and Style.

THOSE of our modern philosophers, who have not enlarged their ideas by the study of antient philosophy, will no doubt be surpris'd at this definition that I have given of *mind*. Such philosophers have no other idea of *mind* but as a thing which thinks and reasons. But those who have been taught by the antients to recognise the *vegetable* and *animal*, as well as the *rational life*, and who have learned that there is in all natural bodies a principle of *activity*, which, according to Aristotle, is *nature* itself, all the rest being nothing but *senseless inactive matter*; and who have also learned, that the chief attribute of divinity is that of being the *first mover* and author of that *motion* by which the whole business of nature is carried on, will judge very differently, and think that I could not have defined *mind* by any property more characteristic of its nature than the *power of moving*, nor any more general, being common to all *minds*, from the highest to the lowest.

As it is necessary that we should know what *motion* is, in order to understand perfectly the nature both of *body* and *mind*, I proceed now to give a philosophical account of it; without which there is no science of metaphysics, nor any perfect science of natural philosophy; *motion* being the sole agent in all natural productions and operations of every kind. Further, it is *motion* that produces all the perceptions
of

of our senses, and, by consequence, our ideas, which all arise from those perceptions; so that the philosophy of *mind* is likewise, in this respect, founded upon *motion*. There is nothing, therefore, in philosophy, which it is of greater importance to understand well, than the nature of *motion*.

According to Mr Locke, there can be no definition of *motion*, because it is what he calls an *idea of sensation*; that is, in proper philosophical language, a *perception of sense*. If this be true, there cannot, for the same reason, be any definition, nor, by consequence, any science of any of the subjects of natural philosophy; for they are all perceived by the senses, as well as motion. *Sound*, for example, is perceived by the *ear*, as *motion* is perceived both by the *ear* and *eye*, and even by the *touch*; therefore, according to Mr Locke's doctrine, there is of *sound* neither art nor science: Nay, there can be no science even of *geometry*; for the subjects of geometry are ideas, which are all abstracted from perceptions of sense, from whence all our knowledge of every kind is derived. If, therefore, there be any truth at all in Mr Locke's observation, it is this, that there can be no science of the particular perceptions of sense; but we must first form, by abstraction, general ideas from those particular perceptions. But this may be applied equally to every thing that is made the subject of science. Let us try, therefore, whether we cannot make of motion an object of intellect, or whether it must continue always to be perceived only by the senses, in the same manner that it is perceived by the brute animals.

The objects of intellect being something fixed and permanent, it seems at first impossible to make an object of intellect of a thing so fleeting and transitory as *motion*, which is not one moment the same thing, but exists by perpetual change and variation. But there is one thing which the intellect immediately apprehends in this so changeable

able being; and that is, *change* itself; for to that *genus, motion* undoubtedly belongs.

Thus far, therefore, a philosopher easily proceeds in this investigation: But it is only a short way; for we have but a very imperfect idea of *motion*, if we know no more of it than that it is *change*; nor can we, by such an account of it, sufficiently distinguish it from another universal which has a great connection with it, but is different, as shall be afterwards shown; I mean *time*. We must therefore know something more particular about it; and, as all *change* is *from* something *to* something, we must inquire *from what*, and *to what motion* is a *change*. And in this inquiry we must have again recourse to *nature*, the great architect of all science and all art. And I hope to show, that Aristotle's definition of *motion* (for it is not mine) is as much founded in nature, as the definition I have given of *body* and *mind*, and proceeds from a view as comprehensive of the nature of things, as it is acute and penetrating.

That *nature* does nothing in vain or at random, but proposes some end in all her operations and productions, must be admitted by every one who believes that this universe is produced and governed by *mind*, and not by blind chance. And indeed, in most things, it is obvious, not only to the philosophical, but to the common observer. For it is of the essence of *mind* to do every thing for some purpose; even subordinate *minds*, we see, act in that manner, always proposing something as their end; and much more must the great *Mind*, that animates and directs this universe, act so. When that *end*, proposed by nature in her productions, is attained, then is the thing said to be in its *natural state*, and which must necessarily be the perfection of its *nature*. This state, in the language of Aristotle's philosophy, is called *entelecheia*, a word made by himself, which, from its composition, denotes *perfection*,
tion,

tion, or the accomplishment of an end *. This word has been much ridiculed as a mere sound without any meaning, invented by Aristotle to cover his ignorance, and impose upon mankind; whereas, it is a word denoting that which is most perfect in natural productions, to which nature always tends, and which, for that reason, is to be considered by every philosopher as principal in nature.

There is also in the works of art a perfection which the artist aims at, and, which when attained, the work is said to be compleated, or in a state of perfection; and, in general, every volition of an intelligent agent proposes some end, which being attained, the action is compleat.

But, in both nature and art, and the actions of intelligent agents, there is a progress, and, by consequence, a *change* from one thing to another; and this change is *motion*: And we have now seen *to what* this *change* is; for, in the progress both of nature and art, it is *to* the end proposed, that is, the *entelecheia*, or state of perfection of the thing.

Further, as there is a state of perfection in all the works of nature and art, so there is also a decay, and at last a dissolution and extinction of all the works of art, and of those too of nature, at least in this sublunary world. For, as animals and vegetables, and other natural productions, come to a state of maturity, so they decline from that state

* The word is derived from *εντελεις ιχνη*; and it is likely that Aristotle has taken it, with some variation, from the books of the Pythagoreans, in one of which, yet preserved to us, viz. Ocellus Lucanus *περι του παντος*, the word *εντελεχεια* is used in the same sense: For, speaking of the *first matter*, he says, *δυναμι ου παντα ειναι τουτ' η πρωτης γινησιως, εντελεχεια δε γινωσκουσα και λαβουσα φυσικη*. Gale's opuscula mythologica, page 517. where we have *δυναμις* and *εντελεχεια*, opposed in the same manner as in Aristotle *δυναμις* and *εντελεχεια* are; and from this, and several other passages that might be quoted, both from this author, and from Timæus the Locrian, it appears, that Plato and Aristotle have not only taken the *matter* of their natural philosophy from the Pythagoreans, but a great part of the *language* of it.

state, decay, and at last are totally dissolved. Now, this progress also is such a *change* as I call *motion*; and thus far we see *from what, to what* the *change* is; for it is from a state of perfection to a state of decay and dissolution.

Here our idea of *motion* begins to be more full and compleat. But, in the other case of the progress towards perfection, it is not so compleat; because we have hitherto discovered *to what* the change is, but not *from what*.

In order to find out this, we must make a distinction, well known in antient philosophy, but which our modern philosophers hardly ever mention; the distinction I mean is betwixt *actual* existence, or existing *εν ενεργειᾷ*, as Aristotle has expressed it, and existing only *potentially*, that is, in *power* or *capacity*. This, however, is a distinction which runs through all nature and art; and, without which, it is impossible to explain perfectly many things in the system of nature. But, as it is so little known, some words will be necessary to explain it.

That every thing existing, whether by nature or art, was, before it existed, possible to exist, is evident; for it could never have existed, if it had not been first in the *power* or *capacity* of existing; and, as every thing both of nature and art is produced by certain determinate causes, the productions both of nature and art are said, with propriety enough, to exist *potentially* in those causes, even before they are produced. And thus, things do in some sort exist, even before they exist: But then this existence is very different from that state of perfection above mentioned, to which when the thing is arrived, it is said to exist *actually*, *ακτῶς, et non potentia*; or, as Aristotle has expressed it, *εν ενεργειᾷ*, a word which he has used to express this kind of existence, which is best shown by its *energies* or operations.

The first kind of existence, which, I know, will, by the unlearned reader, be thought a mere shadow, without substance or reality, is said by Aristotle to be *εν δυναμει*, that is, *in power* or *capacity*. In this way plants exist in their seeds, animals in the embryo, works of art in the idea of the artist and the materials of which they are made, and, in general, every thing in the causes which produce it. From this power or capacity, there is a progress to *energy*, or actual existence: So that here, in the production of things, we find, that there is a progress from one thing to another, *viz.* from a state of mere *capacity* to a state of *actuality* or *energy**.—Again, as before we found, that there was a progress from the state of maturity and perfection of every thing to its decay and dissolution; and as, when the thing is come to its maturity, it has the capacity of decaying and dissolving, the progress thereto may be said to be from a state of capacity to what we may also call *actuality* or *energy*, in as much as it is the end now proposed by nature, as the maturity or perfection of the thing was before. The progress in both cases is what I call *motion*; and it now appears, that, in both, the progress is from *capacity* to *energy*: And we are now able to answer the question proposed above; ‘*from what, and to what, motion is a change?*’ For it is universally true of all *motion*, that it is a change from *capacity* to *energy*; because every motion, however irregular it may seem, and whether proceeding from nature, or from the will and inclination of some sensitive being, has a tendency to some end; which end, when attained, is denoted by the word *energy*: And it is equally certain, that the thing moved must, before it be moved, have the *capacity* or *power* of being moved.

Having thus discovered, that *motion* lies betwixt *capacity* and *energy*, it is evident, that it must have a connection with each of them;
and,

* The progress towards actual existence is expressed in Greek by the word *γινεται*, while the actual existence is denoted by the word *ιστι*. Two words of common use among the Greek philosophers, but which can hardly be rendered into English.

and, from this double connection, Aristotle has given us two definitions of it, one of them taken from the energy, or end, to which it tends, the other from the capacity from which it begins. The first is expressed in two words, *viz.* ενεργεια ἀτελης *, or imperfect energy; the other is ενεληχεια του εν δυναμει ἢ εν δυναμει, which may be translated thus: ‘*The perfection of what is in capacity, considered merely as in capacity.*’ The meaning of the last words is, that nothing is considered in the thing that is moved, but merely its capacity: So that motion is the perfection of that capacity, but not of the thing itself †. The reason why it is said to be the perfection of *capacity* is, that it is something more than mere *capacity*; for it is *capacity* exerted, which, when it has attained its end, so that the thing has arrived at that state to which it is destined by nature, or art, ceases, and the thing begins to exist ενεργεια, or *actually*: And, therefore, Aristotle has very properly called this exertion *the perfection of capacity*, since capacity can go no further.

This last definition appears to be that which Aristotle prefers; for he has given us the other only as it were in passing; whereas this he has given us, when treating formally of the subject; and no doubt it is a better definition; for the other is a definition by negation; whereas this tells us positively what the thing is, and makes the proper distinction betwixt mere *capacity*, and *capacity exerted*; and also betwixt the utmost perfection of *capacity*, and *energy*, or the thing completed.

In this manner I have explained, at some length, this famous definition of Aristotle, which by many has been complained of as obscure;

* Aristotle, περὶ ψυχης, lib. 2. cap. 5.

† In this way Aristotle himself has explained these words in the 9th chap. of his 13th book of Metaphysics. A piece of brass, says he, is a statue, δυναμει (or in *capacity*); but the *motion* by which it becomes a statue is not ενεληχεια, or the *perfection* of the brass, but the *perfection* of its *capacity*.

scure ; and, by others, has been ridiculed as altogether without meaning. But I hope that I have shown, that it is taken from a comprehensive view of nature and art, and of every kind of generation and production *. And I desire any one, who is not satisfied with Aristotle's definition, to try whether he can give a better ; and then he will be convinced of the difficulty there is in defining a thing so shadowy and unsubstantial, that it may be said to be something betwixt the *τὸ μὲν*, *being* and *no being* ; for what exists only *potentially*, may be said not to exist at all. One thing is evident, that it is a definition which has cost Aristotle a great deal of pains, as appears from his treating of it at great length, both in his *Physics*, *lib. 3.* and in his *Metaphysics*, *lib. 13. cap. 9. †*. Our modern philosophers, though they have been at great pains to investigate the laws of motion, have hardly thought it worth their while to tell us what *motion* is ; for, as to the common definition of it, *viz.* change of place or situation, that is not *motion*, but the effect of motion : For, I ask, How is the place or situation changed ? and the answer can be no other than, *By motion*. So that the question recurs, What is this same *motion*, by which not only place and situation are changed, but generation and corruption are produced, growth or decay, alteration of all sorts, and, in short, every change that can happen to *body* ? And, besides, it is not comprehensive enough, as it takes in only one kind of *motion*, *viz.* that from place to place.

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* See this definition of Aristotle more shortly explained in a note upon the 2d chap. of the 1st book of the 1st vol. of the *Origin and Progress of Language*.

† In this chapter, Aristotle is at great pains to show of how difficult definition it is. It is not, says he, *capacity*, it is not *energy*, it is not *privation*, neither is it any of the *categories*, such as *substance*, *quantity*, *quality*, *relation*, &c. not being, like them, any circumscribed or determined kind of *being* ; nor has it any fixed or permanent existence of any kind. Neither does it exist all at once, but by succession. And, after having in this way told us all that it is not, he concludes in this way ; ὅτι λεγεται το λικθην, ειναι και ενεργειαν και μη ενεργειαν την ειρημενην (that is what he calls ενεργεια ὁπλη, or the real existence of any thing), ιδειν μιν χαλεπην ενδεχομενην διειναι. So that it is energy, and not energy, difficult to be seen or comprehended, but possible to exist.

This leads me to the division of *motion* given by Aristotle, and which naturally follows its definition. It is taken from the effects which it produces, and, according to him, is of *four* kinds, and belongs to three categories, viz. *quality*, *quantity*, and *where*. The first kind is that well known *motion* from *place* to *place*, which falls under the category last mentioned; the second is *alteration*, by which the *quality* of any thing is changed, the *substance* remaining the same. This belongs to the category of *quality*. The *third* is *increase*, and the fourth *diminution*, both belonging to the category of *quantity*.

The definition of *motion* above given is such, that it will apply, at least in one respect, to *mind* as well as *body*. And the division now given shows what that one respect is, viz. *quality*: For it cannot be denied, that inferior minds, such as ours, change in *quality*; and, as that change does not happen at once, but by *progression*, that progression is the motion applicable to *mind*; and, accordingly, in common language, we say, that our minds are *moved*, or *altered*; that is, have changed their *quality*. But, with respect to the other three kinds of *motion*, which fall under the two categories of *quantity* and *where*, it is impossible to conceive, that immaterial substances, having no parts, and being indivisible, can be *moved* any of these ways.

And, therefore, though, when our body *moves*, the mind may be said to *move* with it; that is only *κατα συμβεβηκός*, or *by the accident* of its junction with the body; but not *καθ' αὐτό*, or by its own nature, as Aristotle has very well distinguished *. It is, however, true, that when philosophers speak of *motion*, it is always to be understood of *body*, unless they have otherways explained their meaning †.

With

* De Anima, lib. 1. cap. 3.

† As this motion of the mind may appear to many very unphilosophical, see what Philoponus has said upon the 2d book of Aristotle *περί ψυχῆς*, towards the middle of the book, at these words, *πρῶτον μὲν οὐκ ὡς τοῦ αὐτοῦ οὗτος τοῦ πάσχου, καὶ τοῦ κινεῖσθαι, καὶ τοῦ ἐκτελεῖν, &c.* where he says expressly, that *μάθησις*, or *learning*, which is the *change* of the *mind* from a state of ignorance or error to knowledge, is *motion*.

With respect to *bodily motion*, it is to be observed, that it cannot exist without *change of place*, taken in the largest sense: For, though there be no total change of the place of the thing, as in the case of progressive motion, yet, where there is alteration, diminution, or augmentation, there must necessarily be a change of place, at least of the parts of the thing. So that change of place, of one kind or another, is essential to all kinds of bodily motion. But we are not to take change of place, the first member of the above division, in that large sense; but we must understand it only of a total change of the situation of the thing, which is expressed by the Greek word *φορεσις*, denoting *carrying* or *transferring* from one portion of space to another. And, in this way understood, the first member of this division will not comprehend the other three; for the thing that is moved must either change the space it occupies totally, or there must only be a change with respect to its parts. If it change totally, then it is the first kind of *motion* I mentioned; but, if not totally, if the *motion*, for example, be only internal, so that there is no more but a transposition of the parts of the thing, or if there be an addition to the space the thing occupies, by an addition to its parts, then is there one or other of the three motions above mentioned.

Before I quit this subject, I cannot help observing, that Aristotle has, I think, shown a great superiority above his master Plato, in treating this subject of *motion*: For, in the *first* place, Plato has not thought proper to give us any definition of it; but, for that, has, like Mr Locke, trusted to common sense and apprehension. Whether it was, that he thought that sufficient, or that, according to his system of ideas, there could be no idea of *motion*, not being a substance, nor having any thing fixed or permanent. But, though he has not defined it, he has divided it with great appearance of accuracy*; for he has made no less than ten different kinds of it. The first is, that, where the *motion* is,

* De Legibus, Lib. 10. page 950. editio Ficini.

is, as he expresses it, *in one place*, such is the *motion* of a circle round the centre, or of a line, in the formation of a circle, round one point; by which, he observes, a thing is produced, that he calls very wonderful, namely, that the same *motion* should have different degrees of quickness and slowness, according as the several circles, produced by that *motion*, are greater or lesser, and in proportion to the difference of the circles. The *next* kind of *motion* is, when the place is changed, and the body moving is continually changing its centre. The *third* he calls *separation*; the *fourth* is *composition*; the *fifth* is *diminution*; the *sixth*, *augmentation*; the *seventh* is *generation*, by which *body* acquires its three dimensions, and becomes perceptible by *sense*; the *eight* is *corruption* or *destruction*; the *ninth* is that *motion* which can move other things, but cannot move itself; and the *last* is that which can, not only move other things, but itself, and which produces all the other motions above mentioned.

Here it may be observed, that the several members of this division plainly comprehend one another; so that, properly speaking, it is no division at all. For the *first* kind of motion which, he says, is in one place, is plainly comprehended under the *second* member of the division, viz. *motion* which changes places: For it is a subdivision of that kind of *motion*, which is, either when the whole body changes its place, that is what we call *progressive motion*; or, when only the parts change place, the whole body continuing to occupy the same space. In this way, he might have made a distinction of *motion*, by change of place; but, to divide *motion*, as if any of it could be without change of place, taken in the large sense, was improper. The *third* and *fourth* members are also the same with the *fifth* and *sixth*; for *diminution* is nothing but *separation*, and *augmentation* is nothing but *composition* or *accumulation*. As to the *seventh*, viz. *generation*, it is rejected altogether by the Doctors of the Peripatetic School; because a thing cannot be said to be *moved*, or to be, in any way, either *active* or *passive*, before it exist; they do not, there-

therefore, say, that the thing which is in generation, or in the act of being generated, *is moved*, but the elements of which it is composed are *moved*. And, as to *corruption*, there can be no doubt but that the thing corrupted is *moved*; but it is a *motion* which falls under one or other of the four heads mentioned by Aristotle. And, *lastly*, in the *ninth* and *tenth* members of Plato's division, it is plain that he confounds the *power moving*, or the cause of the *motion*, with the *motion* itself. For, when one *body*, by impulse upon another, *moves* that other, it is plain that the *motion* of the *body moved* is the same as if it were produced by any other cause. And, as to the *body moving*, it is no more than the *instrument* by which the motion is performed. So that *body* cannot, with propriety, be said to *move*, but only *mind*, either immediately and directly, or mediately by the interposition of some other *body*; as, when I *move* a stone by a lever, it is not the lever that *moves* the stone, but *I* using the lever as an instrument. And, as to the *tenth*, it is confounding *body* with *mind*, the *motion* of *body* with the *motion* of mind, and the *effect* with the *cause*; for the mind that *moves* is certainly different from *body* that is *moved*, and the action of *mind* is likewise distinct from the *motion* of *body*; and the *motion* produced in *body* is an effect which must be different from the cause that produces it.

This is the division of Plato, liable to so many objections. On the other hand, Aristotle's division is full and comprehensive, but without repetition, or one member of the division including the other. For *change of place*, in the first member, taken in a strict sense, and as it is commonly understood, for a total change of the situation of the thing, does not comprehend the other three. And it was necessary, according to the notions of the antients, that these kinds of motions should be distinguished from the first: For, though the celestial bodies are continually changing their situation, and, in that sense, always in motion, yet, if Plato and Aristotle are in the right, they suffer no alteration, augmentation, or diminution.

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The difference of style, also, betwixt the master and scholar, in treating this matter, is worth being observed. Plato, by the affectation of variety and elegance, both of words and composition, has made the matter really very obscure, even to those who understand both the language and the subject, and are conversant in the writings of the Greek philosophers. On the other hand, the style of Aristotle, in treating this, and every other matter of science, is perfectly didactic, without that superfluity of words which is frequently to be found in Plato, and without any ornament, either of words or composition; and, tho' its brevity may make it obscure to the unlearned, which his interpreters say he intended, I will venture to say, that, where the text is not corrupted, which it frequently is, and where the work had received the last hand of the author, which was certainly not the case of all his works, it is to be understood, by the learned, with due pains and attention; and I will further venture to say, that, when he has found out the meaning, he will think his pains and attention well bestowed.

To conclude: From the account here given of *motion*, it is evident that by it the whole business of nature, above, below, and round about us, is carried on;—that nothing which has a beginning, or is to have an end, can be produced or put an end to, without it;—that, as nature is continued and connected in all her operations, not proceeding by starts and bounds, but by regular gradations, it is impossible that any thing can be generated, come to maturity, or be extinguished, without passing from one state to another. Now that passage is *motion*. To those, therefore, who hold that *mind* is the first of things, and principal in the universe, it will not appear surprising that I have made *moving*, or *producing motion*, an essential attribute of *mind*.

C H A P. IV.

Universals *connected with Motion*—Habit—Power of two kinds, viz. Capability—and Faculty—Energy likewise of two kinds—different from Action—Action and Passion reciprocal—The two great Principles of Nature are One Thing, that is always active, and another, that is always passive—Change a very general Idea—more general than Motion—Different kinds of Change—All Change produced by some Cause—Different kinds of Causes—The Doctrine of Causes a great Discovery of Aristotle—Of Being, and the Accidents of Being.

HAVING thus explained the general idea of *motion*, I will now proceed to explain some other *universals* which are connected with it, and belong to the system of the universe.

In the *first* place, as we have seen that *motion* is a progression from one state to another, it is proper to explain what *state* is, which is supposed to be something permanent, in contradistinction to *motion*, which, by its nature, is fleeting and transitory. A state, in this sense, is what is called in Greek *ἕξις*, and which is properly translated into English by the word *habit*, though that word be commonly used in an abusive sense, to denote *custom* or *use*, by which *habit* is formed. Now, *habit* is a certain constitution, frame, or disposition of parts, whether it be the work of nature or art, by which every thing is fitted to act or suffer in a certain way; for nothing exists that is not, by nature or art, destined for one, or other, or both of these purposes, otherways it would exist in vain; and nature does nothing in vain;
nor

nor does art, which acts in imitation of nature : And therefore *habit* is properly defined, in reference to some *action* or *passion* *.

From *habit* necessarily results *power* or *capacity*, (in Greek *δυναμις*), which Aristotle has distinguished into two kinds. The first is, the *mere capacity of becoming any thing*. The second is, the *power* or *faculty of energizing*, according to the habit, when it is formed and acquired ; or, in other words, after the thing is *become*, and actually exists, which at first was only in the *capacity of existing*. This Aristotle illustrates, by the example of a child, who is then only a *general* in *power*, (*ἡ δυναμις*), that is, has the power of becoming a general : But, when he is grown up, and has become a general, then he has the power of the second kind, that is, the *power* of performing the office of a General †. Aristotle, in the passage quoted below, says, that this difference is anonymous in Greek. But, as it is fit that two things so different should be distinguished by different names, I would call the first *capability*, and the other *faculty* ; and I would say that the child has the *capability* of being a General, but, when he is grown up, and has learned the business, he has the *faculty*. It is to be observed, that Aristotle, when he uses the word *δυναμις*, or *power*, simply, as in his definition of *motion*, means the first kind of *power*, or what I call *capability* ‡. It is also to be observed, that *power*, or *capacity*, is *active* as well as *passive*, and that

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there

* *ἔξῃς* is defined by Aristotle, lib. 5. Metaph. cap. 20. to be, in one sense, the same with *διαθεσις*, which he defines, cap. 19. in this manner, *Διαθεσις λεγεται του εχοντος μιση ταξις, η κατα τοπον, η κατα δυναμιν, η κατ' ειδος. Θισιν γαρ δει τινα ειναι, ὡσπερ και το ονομα δηλοι η διαθεσις* : But his commentators make a distinction betwixt the two ; for they say *ἔξῃς* is more permanent, *διαθεσις* less so. And I think there is the same distinction in English betwixt *habit* and *disposition* ; which last word answers exactly, both in sense and etymology, to the Greek *διαθεσις*.

† Aristotle, *περι ψυχης*, lib. 2. cap. 5. *in fine*.

‡ See further, upon this subject, Philoponus's commentary upon the chapter above quoted of Aristotle, *περι ψυχης*. See the 8th book of Aristotle's Physics, and Simplicius's Commentary, page 281. See also Aristotle's Metaphysics, lib. 1. cap. 12. and lib. 9. cap. 1.

there is a *power* of *suffering*, as well as of *doing*; and these two powers correspond to one another *.

As from *habit* results *capability*, and from *capability* *faculty*, so from *faculty* results *energy*, which is the faculty exercised or produced into action. But this *energy*, which is the result of *habit* and *faculty* formed, is to be distinguished from those *energies* by which the *habit* or *faculty* is acquired. Thus, the *energies* of a person who learns any art or science, are different from the energies of that art or science, after he has learned it. And, in the same manner, the energies or operations of nature, by which any natural substance is formed, are different from the operations of that substance after it is formed. Of the first kind are the energies of *motion*, which, as I have said, is a passage from one state to another. But the other kind of energies, though they be a change likewise from a state of *rest*, to a state of *activity*, and therefore fall under the general definition of *motion*; yet they are a different species of *motion*, commonly expressed by the term *action* †.

This leads me to inquire into the nature of this universal *action*, and its correspondent, *passion*, which run through the whole of nature; for every thing, as was said, is destined by nature to act or suffer, or both ‡; and, where there is an *agent*, there must of necessity be a *patient*, that is, something on which the operation is performed.

And

* Milton, therefore, has made Belial say very properly,

——“ to *suffer*, as to *do*,

Our strength is equal, nor the law unjust,

That so ordains,”——

Par. Lost. lib. 2. v. 199.

And, from many other passages of this poem, it appears that Milton was very well acquainted with this highest philosophy of which we treat.

† See Aristotle's *Metaphysics*, lib. 9. chap. 6. where power and energy are very well contrasted together, and illustrated by many examples.

‡ Archytas *πρὸς τοὺς φυσικοὺς*, a treatise preserved to us by Simplicius, in his commentary upon Aristotle's *Categories*, has said, in a passage quoted by Mr Harris, in his *Philosophical*

And we will begin with *patience* or *suffering*, in Greek *πασχειν*, and which, as well as *motion*, belongs to the general idea of *change*; for we can conceive no suffering without some change in the *patient*. But, then, what *change*? Is it a *change* from place to place? or from greater in quantity to less, or *vice versa*? or is it only a change of quality? And this last is the truth, according to the doctrine of Aristotle, and his commentators. For, in their language, where *a thing changes place*, or *increases* or *diminishes*, it is *moved*, but does not *suffer*, unless it be changed in *quality*. *Suffering*, therefore, is only in one *category*, viz. the category of *quality*, whereas *motion*, as we have seen, is in three categories, viz. *quantity*, *quality*, and *where*; the necessary consequence of which is, that every thing that *suffers* is *moved*, but not *vice versa*: So that the idea of *motion* is more general than that of *suffering*, and comprehends it. Again, as *acting* and *suffering* are relatives, of which one cannot exist without the other, and must necessarily correspond in every particular, it follows that, to *act* is to operate a *change* of quality in the *patient* *.

Farther, as much as the agent *acts*, so much must the patient *suffer*; or, in other words, the impression made upon the *passive* object must be just in proportion to the force of the *active* object: And this too is a necessary consequence of *action* and *passion* being relative and corresponding in every particular. It is in this way that I would understand that maxim of the Newtonian philosophy, "that *action* and *re-action* are equal;" though I think *re-action* is a very improper term

phical Arrangements, page iii. that every thing in nature either acts or suffers, or both acts and suffers; what only acts, but does not suffer, is God; what only suffers, but does not act, is matter, or the *first matter*, as we commonly call it; and the elements of other natural substances, are both *active* and *passive*.

* See Aristotle, Book 2. *De Anima*, and Philoponus's commentary upon these words, towards the middle of the book, *πρωτον μιν ουκ, ως του αυτου οντος, του πασχειν και του κινησθαι*, &c. where Philoponus observes, that *πασχειν* is derived from *παιος*. See also Aristotle's metaph. lib. 5. chap. 21. where he gives us the several significations of the word *παθος*.

term for expressing the mere passivity of any thing: Nor do I well conceive how it can be applied, except to elastic bodies, which, no doubt, *act* as well as *suffer* *.

But, is there no *change* in the *agent* as well as the *patient*? There is, when the *agent* changes from a state of *rest* to *activity*. But, suppose a being to energize continually, as we conceive of superior natures, to whom the distinction above mentioned, betwixt capacity and energy, does not apply. In such beings there is no *change* from *inactivity* to *activity*. And, if we can suppose, in such a being, no succession of energies, or passing from one to another, but, as Philoponus expresses it, in the passage above quoted †, *all the energies thrown out at once*, then there is no change at all in the agent. And this is the idea we ought to have of the Supreme Being, as shall be afterwards more fully explained.

But what shall we say of the energies of inferior *minds*, such as ours, which either do not energize perpetually, or at least energize by succession? Can they be said to *suffer* when they *energize*? As, for example, when a man having acquired the science, or *habit* of a geometer,

* If the Newtonian philosophers had not asserted, in the clearest terms, the mere passivity of matter, and its indifference, either to motion or rest, one should have thought, by their way of expressing this law of nature, that they imagined matter, *qua* matter, had a power of action in it; for this the term *re-action* seems to import. But, as Baxter, in his Enquiry into the nature of the human soul, has well observed, it denotes no more than *resistance* or *resistency*, which is necessarily implied in all passion; for we cannot conceive passion without some resistance. But then this resistance must be overcome, otherwise there can be no *impression made*, nor any change of any kind produced in the patient; and, if so, how can action and resistance be equal; therefore I doubt whether, even with that explication, the maxim be true. But the truth is, when properly expressed, what I have laid down in the text, that *action* and *passion* are equal, in so far as they must necessarily correspond to one another. I have heard another meaning given to this law of motion, viz. that as much force as the *active* body communicates to the *passive*, so much it loses of its own: But, even in this way understood, it is not expressed properly, nor with that clearness and accuracy, with which an axiom should be expressed.

† *αρεα προβλη απο ιδως των ενεργειων.*

meter, and energizes according to that habit, that is, demonstrates geometrical propositions, does he *suffer*? And Aristotle, and his commentator on the passage above quoted, say, that he does not; because there is no change of *quality*, but only the bringing of *habit* into *perfection* by exertion. For the same reason, he cannot be said to *act*, because he produces no change of *quality*; yet he energizes. Every *energy*, therefore, of a *habit* formed, is not *action*, unless it produce a change of *quality* upon something: And, with this distinction, we are to understand the general position above laid down, 'That the energies of formed habits fell under the category of *action*.'

The idea, therefore, of *energy*, is more general than that of *action*, and comprehends it; for, whatever *acts*, *energizes*; but not *vice versa*. And hence it is, that *energy* is applied to all *beings*, even the Supreme Being, who is said, by Aristotle, to be all *energy*, without mere *power* or *capacity*; which, in its nature, is something imperfect and defective, and therefore cannot be ascribed to the Supreme Being*. Neither can this Being be properly said to *act*, unless where he produces changes upon any subject; and far less can he be said to *suffer*: But *energy* applies properly to all the operations of such a being; and it is, as I have observed, *energy* without ceasing, and without transition from one thing to another.

As all generation and corruption are produced by *acting* and *suffering*, and as generation and corruption are continually going on in this lower world, it is evident, that the two great principles of nature are, that which always *acts*, and that which always *suffers*†: And this brings

* Aristot. Metaphys. lib. 14. cap. 6. 7. 8.

† To the same purpose is a passage in an older book of philosophy still than the works of Archytas, I believe the oldest extant, of whose authenticity we are certain, and from the same school, viz. Ocellus Lucanus, who writes, *περι του παντος*. The words are, *Α. δι μοιρας αυται διοριζουσι και ταμευσι το τε απαις μέρος του κοσμου και ακινητον*; where Gale, who has published

brings us back to the first division I made of *things* into *mind* and *body*, *mind* being always *active*, *body* always *passive*.

Further, as there can be no *generation* or *corruption* without *change*, every thing here below the moon must, of necessity, be in a constant vicissitude and succession of one state to another. *Change*, therefore, is a most general idea, more general than even *motion*; for all *motion* is *change*, and, accordingly, we have made change the *genus* of motion: But all change is not motion; for there is a change from *non-existence* to *existence*, which is called *γένεσις*, or *generation*; but which, as I have already observed, is not *motion* *.

With respect to those changes made upon any thing, the substance still continuing the same, it is to be observed, that, if the change be from

blished this work in his Opuscula Mythologica, very properly corrects the text, p. 515. by reading *αἰσπαθεῖς*, (a word, which is used by the same author in a fragment of his preserved by Stobaeus, inserted also by Gale in his Collection, page 538.); for, without that correction, *απαθεῖς* and *ακίνητος* would denote the same thing; because, what is incapable of suffering, is, by consequence, incapable of being moved: But he carries his correction too far, when he changes *ακίνητος* into *αεκίνητος*, that word denoting what is always capable of being moved; which is certainly not the meaning of Ocellus Lucanus; for then again there would be no opposition betwixt the two principles. We must, therefore, let the word *ακίνητος* stand as it is, or, if we will change it, it must be into *αεκίνητικος*; which, I am persuaded, is the true reading in the fragment above mentioned, of the same author, in place of *αεκίνητος*; so that we ought to read there, *το δὲ αεκίνητικόν κυβερνῇ, το δὲ αἰσπαθεῖς κυβερνέται*; and so the sense of both passages will be the same, viz. that, in nature, there are two principles, the one that always *acts*, and never *suffers*; the other that never *acts*, but always *suffers*; that is, in two words, *mind* and *matter*; which I apprehend to be the true system of the universe, if we understand by *matter*, not *body*, that is, *matter* with its several qualities of extension, resistance, &c.; but the *first matter*, that is, *matter* without any of those qualities, which, as we shall see afterwards, was held in the Pythagorean school to be one of the principles of nature. And what makes the division betwixt these two principles of nature, is, according to our author, the course of the moon, which he says is the isthmus betwixt immortality and generation. *Ἰσθμὸς γὰρ ἐστὶν ἀθανασία; καὶ γένεσις ὁ περὶ τὴν σελήην ὁρμος.* Ibid.

* Aristotle calls this change *ἐκ οὐχ ὑποκειμένου εἰς ὑποκείμενον*. Metaphys. lib. 13. chap. 11. See also Philoponus in the passage above quoted. See further, Philoponus's commentary upon the third chapter of the first book of Aristotle *de Anima*.

from *capability* to *habit*, such a change being for the better, and being the perfection of the thing, not the destruction, is not said to be *suffering*; and, in general, that term is not applied, but to a *change* that is accompanied with some destruction, *φθορα*; as, for example, when *black* is changed to *white*, there is a destruction of the black; and, in general, when any quality of a subject is changed, there is a destruction of the quality from which the change is. Therefore, in such cases, there is *suffering*; but, in all other changes, there is only *alteration*, or *αλλοιωσις*, except in the change above mentioned, from *nonentity* to *entity*; for that is not even *alteration*, which is only from one species of quality, or accident, to another, the subject remaining the same *.

All *change* must be produced by some cause; the idea of *change* is therefore necessarily connected with the doctrine of *causes*; in treating of which, Aristotle has excelled all the philosophers that went before him; nor has there been any thing worth observing added to his discoveries since. And, as it belongs to the first philosophy to know the first causes and principles of things, it is of necessity that the metaphysician should know the *nature* of a *cause*, and be able to distinguish the different kinds of them.

The general idea of a *cause* is, *That, without which, another thing, called the effect, cannot be*; and it is divided by Aristotle into four kinds, known by the name of the *material*, the *formal*, the *efficient*, and the *final*. The first is, *that* of which any thing is made: Thus, *brass* or *marble* are the *material causes* of a *statue*; *earth, air, fire, and water*, of all natural bodies. The *formal cause* is the *form, idea, archetype, or pattern* of a thing; for all these words Aristotle uses to express it. Thus, the *idea* of the artist is the *formal cause* of the statue; and of all natural substances, if we do not suppose them the work of chance, the *formal cause* are the *ideas* of the *divine mind*; and

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this

† ἢ ἐκ εἰδοποιήσαντος εἰς εἰδοποιούμενον, τοῦ αὐτοῦ ὑποκειμένου μινοντος. See Philoponus, *ubi supra*.

this *form*, concurring with the *matter*, produces every work, whether of *nature* or *art*. The *efficient cause* is the principle of the *change* or *motion* which produces the thing. In this sense, the statuary is the *cause* of the statue, and the God of nature, the *cause* of all the works of nature. And, *lastly*, the *final cause* is *that, for the sake of which, any thing is done*. Thus, the statuary makes the statue for pleasure, or for profit; and the works of nature are all for some good end *.

It may be observed of these *causes*, that the two first of them, *viz.* the *material* and the *formal*, are *internal*, and make part of the thing †; and the *formal cause* is what is commonly contained in the definition of the thing ‡.

It may be also observed of this division of causes, that two of them plainly suppose a *mind* and a *design* in nature as well as in art, *viz.* the *formal* and the *final*; for it is evident, that neither of these could exist, if the *universe* was the work of chance, or of *material causes*.

This discovery of Aristotle concerning *causes*, is, I think, one of the principal things that he has added to the stock of philosophy; for, according to the account that he gives of the opinions of philosophers before him, it is evident, that, when they were inquiring about the *causes* and

* See all this explained at great length by Aristotle, lib. 2. cap. 3. of his *Physics*, and lib. 5. cap. 2. of his *Metaphysics*, where there are many distinctions made, very well worth attending to, betwixt the first and second principal and subordinate causes. See also what Fonseca, a learned Jesuite, in his commentary upon Aristotle's *Metaphysics*, has said upon the subject of these causes, *quaestio* 1. *ad caput* 7. lib. 1. *Metaphysic.* where he demonstrates, that there can be neither fewer of them nor more.

† These are called by Aristotle *εἰσπαρχόμενα*.

‡ This is what Aristotle calls the *τὸ τί ἐστι εἶδος*, or, the *λογος τῆς οὐσίας*, or simply *λογος*; whereas the *οὐσία* is the natural substance, or the thing as it exists, (*Aristot. de Anima*, lib. 2. cap. 1.), that is, a compound of the *matter* and *form*. There is nothing, however, to hinder the *matter* likewise to be taken into the definition; and, in that way, Aristotle says, 'that all natural substances should be defined;' lib. 6. cap. 1. *Metaphysic.*

and *principles* of things, they were seeking for they did not know what ; and, therefore, some of them stumbled upon one kind of *cause*, and some of them upon another ; and there is one of them, *viz.* the *formal cause*, of which all the philosophers before Socrates were ignorant, if it be true what Aristotle says, ‘ that Socrates was the first who defined any ‘ thing *.’ It was only the *material cause* that the first philosophers of Greece, as he says, and particularly Thales, sought after. Plato, the scholar of Socrates, appears to have been the first of the Ionic school that introduced *formal causes* into natural philosophy. These he called *ideas*, and made them the principles of all things. And the reason why he insists so much upon this kind of cause, and so little upon the other three, is given us by Aristotle in the end of his first book of metaphysics, *viz.* ‘ that he studied mathematics too much, ‘ and, instead of using them as the *handmaid* of Philosophy, made them ‘ *Philosophy* itself †.’ Upon which Alexander Aphrodisiensis, in his commentary upon Aristotle’s Metaphysics, and Fonseca, the learned Jesuite above mentioned, have very well observed, that mathematics inquire not about any other cause, except the *formal*, neglecting altogether the *material*, the *efficient*, and the *final*. Plato, however, in the Phædo, speaks a good deal of *final causes* ; but, in the system of natural philosophy, which is contained in the Timæus, he says very little of it. As to *efficient causes*, Aristotle tells us, that Anaxagoras was the first who introduced *mind* as the *efficient cause* of the universe ; for which he commends him, as speaking like a sober man among babbling drunkards ; for he appears every where to take pleasure in decrying the philosophy before him : And, with respect to this doctrine of causes ‡, he says, ‘ That philosophy before his time did not well know what it ‘ would be at, and did but lisp and stammer.’

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* Metaph. lib. 1. cap. 6.

† Γνωσις τα μαθηματικά τοις νυν ἡ φιλοσοφία, φησικέταιν ἄλλωι χάριν αὐτὰ δὲν πραγματευόμεναι ; pag. 854. edit. Du Val. As he is speaking there of the doctrine of ideas, the observation is undoubtedly meant to apply to Plato, and to his followers who espoused that doctrine ; and I think may very well be applied to some philosophers of our age, who make mathematics the whole of philosophy.

‡ Lib. 1. Metaphys. in fine.

There yet remains another *universal* to be considered, more universal than any I have hitherto mentioned, viz. *being*; for this is an idea that applies to every thing which exists in any way, whether as *substance* or *accident*, whether *actually* or *potentially*, whether in the nature of things, or only in our notions; for even what we call *entia rationis*, or fictions of our mind, such as a *hippocentaur*, or *mountain of gold*, have a *being*; even *negation* or *privation* have an existence; nay, according to Aristotle, we can say, that *nothing* has a *being* *. In short, wherever we can use the substantive verb *is*, there must be some kind of *being*.

It is not, however, all the kinds of *being*, that I have mentioned, that are the subject of metaphysics; for, as I observed before, nothing is the subject of metaphysics but things existing in nature, either *actually* or *potentially*. And therefore, abstract notions, which exist only in the *mind*, have nothing to do with this science; so that, in metaphysics, there is no difference betwixt the abstract and the concrete †.

As all things existing are either *substances* or *accidents*, and as accidents have no existence independent or by themselves, it is manifest, that substance is that which chiefly deserves the appellation of *being*, as it is that in which all other things exist. Whatever other thing, therefore, is spoken of as existing, must be in reference to substance ‡. In this manner, all the other nine categories, *quantity*, *quality*, &c. exist only in reference to the first *substance*; and even the *negation*

* το μη ον, είναι μη ον, φησιν. Metaphys. lib. 4. cap. 2.

† This is the foundation of the maxim which is delivered by Fônfeca, page 839. as the common opinion of all the philosophers. 'In transcendentibus concreta et abstracta prædicari de se invicem, ut *unum de unitate, unitas de uno, verum de veritate*,' &c.

‡ See Aristotle's Metaphysics, lib. 4. cap. 2. where he says, that every thing that exists is either ουσια or παθη ουσιας, or εδος ως ουσιας, η φθορα, η στερησις, η ποιησις, η ποιητικα, η γεννητικα ουσιας, η τωι προς την ουσιαν λεγομενων, η τωτων τινος αποφασις, η ουσιας. δια και το μη ον, είναι μη ον, φησιν.

negation of being, or nonentity, has, as I have observed already, an existence, by having a relation to *substance*. Being, therefore, is principally predicated of substance; and, though it be also predicated of other things, it is not so predicated exactly in the same sense; yet, not *homonymously*, or *equivocally*, but in a way that Aristotle calls $\pi\rho\sigma\ \epsilon\iota\varsigma$, that is, in relation to *one* thing which is considered as principal; for that is the proper meaning of the preposition $\pi\rho\sigma$ with the accusative case: And he illustrates this by the example of the word $\iota\gamma\iota\epsilon\iota\varsigma$, or *healthy*, which applies equally to what produces health, what preserves health, and what is a sign of health; all which significations are not *homonymous*, neither are they synonymous, but they are something betwixt the two; for they are $\pi\rho\sigma\ \epsilon\iota\varsigma$, that is, they have all a relation to *one* principal thing, viz. *health*, that being the chief thing in them all.

One is also an universal predicate, as well as *being*, of all things existing; for every thing that has a *being*, considered separately, and as distinct from other things, is *one*: And this is not only true of *substances*, but of all their properties and accidents; for every one of these is by itself *one*. So that *one*, as well as *being*, is the general predicate of all the categories*; nor is there any difference betwixt *being* and *one*, or the $\tau\omicron\ \epsilon\iota\varsigma$ and the $\tau\omicron\ \epsilon\iota\varsigma$, as Aristotle has expressed it, except that *one* expresses the negation of *many*, which *being* implies.

Opposed to *one* is *multitude*, and of these two the universe may be said to consist; for all is either *one* or *many*, and every thing is divisible or indivisible. Under *one* Aristotle classes the ideas of *same*, *like*, and *equal*; and under *multitude*, he ranks *diversity*, *unlikeness*, and *inequality*; all which terms he very accurately explains†. And these

two

* Metaphys. lib. 10. cap. 2.

† Metaphys. lib. 10. cap. 3. See what further Aristotle has said upon the subject of *the one* in his Metaphysics, lib. 5. cap. 6. where he has very accurately distinguished the different significations of the $\tau\omicron\ \epsilon\iota\varsigma$, and explained what *one* in number is, *one* in species, *one* in kind, and *one* in proportion or analogy.

two may be ranked among the principles of the universe; for of *one* and *multitude*, *sameness* and *diversity*, *likeness* and *unlikeness*, *equality* and *inequality*, the *whole* of *things* is composed, making that '*rerum concordia discors*,' of which Horace speaks.

All *substances* have *accidents*; for every thing in nature *acts* or *suffers*, and has qualities by which it *acts* or *suffers*.

These accidents are predicated of substances either *καθ' αὐτό*, or *κατὰ συμβεβηκός*, words which occur very frequently in Aristotle's writings, and therefore ought to be explained. An *accident* is *καθ' αὐτό* of a *substance*, when it is necessary to that substance, so as the substance cannot exist without it. This is the case when it is deduced by necessary consequence from the definition of a substance; for, if it be included in the definition, then it is not *καθ' αὐτό*, but part of the *το τί ἐστιν αὐτοῦ*, or *λόγος τῆς οὐσίας*:—That is, in English, It is not an *essential* property of the substance, but the *essence*, or part of the *essence* of the substance.

In this manner, to have the three angles equal to two right angles, is an essential property of a triangle; whereas, being bounded by three lines, is the *essence* of a triangle. It may be observed, that a property may be necessary to a thing, and yet not be *καθ' αὐτό* of that thing. For example, having three angles equal to two right, is a necessary property of an *isosceles* triangle, yet not *καθ' αὐτό* of it, but of a triangle; because it does not result from the definition of an *isosceles* triangle, like the property of having two angles at the base equal, but from the definition of a triangle: On the other hand, an *accident* is *κατὰ συμβεβηκός* of any substance, when it may, or may not, accompany the substance, and yet the substance continue the same; so that such an accident is what, in common language, is called *accidental* to a *thing* *.

These,

* Aristot. Metaphys. lib. 5. cap. 18. and 30. And, in the first chapter of the first book of metaphysics, he gives an example of a *thing* being *κατὰ συμβεβηκός*, or by accident,

These, and many other such words, used, not only in metaphysics, but in other sciences, Aristotle has explained very diligently in his fifth book of metaphysics, distinguishing all the different significations in which they are used, but ascertaining one principal to which all the rest refer. It is, I believe, the best metaphysical vocabulary extant, and will be very much esteemed by those who know how much accurate speaking contributes to just thinking: For, though the distinctions there made may seem trifling and frivolous, or, perhaps, not intelligible to those who have not learned to know the difference betwixt *common sense* and *philosophy*, they will, to the learned, appear useful in all reasoning, and especially upon matters of abstruse science, but of absolute necessity in refuting captions and sophisms, which, without those distinctions, cannot be answered.

CHAP.

accident, which may at first sight appear a little extraordinary. He says, that a physician does not cure a man except *by accident*, but *Calias* or *Socrates*, or any other who happens to be a man. But, is there no *general* of which *curing* can be properly predicated? There is; and Aristotle has expressed it by the Greek word *διπαρτιν*, which we may translate *curable*. Milton, who was learned in the philosophy, as well as the language of the Greeks, has used the expression *by accident* in this philosophical sense. For, in the argument to *the Sampson Agonistes*, he says, 'That Sampson, when he pulled down the house, killed the lords of the Philistines, and himself *by accident*;' which, at first sight, must appear very strange; as the killing of himself was as necessary as the killing those lords. But the meaning is, the killing those lords was the intention of Sampson, not the killing himself; which, though it necessarily happened along with the other, was *beside* his intention. The killing, therefore, the lords, was *καθ' αὐτο* with respect to his intention: But the killing of himself was *κατὰ συμβεβηκος*, or *by accident*. In this sense, it is, that, as I before observed, our *mind* is said to be moved when our *body* is moved; for that is not; nor can be *καθ' αὐτο*, as the *mind*, not having parts, is incapable of motion from place to place: It is therefore *κατὰ συμβεβηκος*, that is, not by its own nature, but by *the accident* of its being joined with the *body*. In this way, also, a man is moved by the motion of a boat, in which he is, with this difference only, that the man in the boat may be moved *καθ' αὐτο*, though he is at that time moved *κατὰ συμβεβηκος*; whereas, the *mind* cannot at any time be moved *καθ' αὐτο*.

C H A P. V.

Mind, the chief Subject of Metaphysics, but not the only—Being, and its general Attributes, the Subject of Metaphysics—The Universe also, and the first Causes and Principles of Things—Full Definition of Metaphysics—The Properties of this Science, and the several Names by which it is known—Encomium of it by Aristotle—The Subject of it the same with the Dialectic and the Sophistical Art—The Knowledge of it necessary for detecting the Fallacies of the Sophists.

THOUGH *mind* be, as I have said, the chief subject of *metaphysics*, there are other things in nature of which the consideration belongs to the *first philosophy*; for, even with regard to *mind* itself, as it is but one kind of *being*, the nature of it cannot be fully understood, unless we know what *being* in general is, and what are the common *accidents*, or properties that belong to it as *being*. The subject, therefore, of metaphysics, according to Aristotle, is the *ens*, or *being*, qua *being*; for he tells us, that it is not any particular kind of *being*, such as *animals* or *vegetables*, *lines* or *numbers*, that is the subject of metaphysics, but *being* in general, and its common attributes*. And he is at great pains to show, that, though the subject be so comprehensive, and so various, yet the science is but *one*†.

Some of the common attributes of *being* I have already mentioned; one particularly with which I set out, and which is principally to be attended to, viz. that some beings are, by their nature, intirely separated from *matter* or *body*, while others are joined with it. Whether

* Metaphys. lib. 4. cap. 1. et lib. 6. cap. 1.

† Metaphys. lib. 4. cap. 2.

ther there was any *being* intirely separated from *body*, appears to have been a doubt in the time of Aristotle as well as now: And it appears, from several passages in his metaphysics, that it was the chief purpose of that work, to prove, that such *beings* did exist; and, accordingly, with that proof he concludes the work. It is therefore evident, that, according to Aristotle's notion, *mind*, and that most perfect *mind*, which is separated from all *matter*, was the chief subject of metaphysics. But, as *mind* is one kind of *being*, it is not possible perfectly to understand the nature of *mind*, without knowing what *being* is, and its general attributes, which must belong to *mind*, as well as other *beings*: And there is one kind of *being* which it is absolutely necessary to know, in order to understand the nature of *mind*, and that is *body*; for, as *body*, according to the definition that is given of it, is as opposite to *mind*, as negation is to affirmation; and as of *opposites* there is the same science, it is impossible that the one can be understood without the other. And it is for this reason, that, in this science, though the chief subject of it be *mind*, I have thought proper to say so much of *body*, and shall still say a great deal more of it.

Further, all *beings* are contained in the *universe*; and the *universe* itself is a *being*, and *one being*, according to the notion of all the ancient philosophers that were not Atheists, and, according to the notion of some of them, an *animate being* *. Now, if there be any philosophy, or science of any kind, to which the knowledge of this *being* belongs, it must be metaphysics; nor is there any philosophy to which

* This was undoubtedly the doctrine of the Pythagorean school, as is evident from that most valuable fragment of it, still preserved in the treatise of Timaeus the Locrian, *De anima mundi*. And in this, as in other things, Plato follows the philosophy of Pythagoras, as is evident from the dialogue which bears the name of *Timaeus*, pag. 1048. *editio Ficini*.

the definition of *philosophy* in general can be so well applied, viz. the *knowledge of all things divine and human*; that is, the whole *universe* †.

Now, as all things cannot be known by the human mind, otherwise than in their first causes and principles, the first philosophy must necessarily be the knowledge of such first causes and principles, which are the first of *beings*, and do virtually contain in themselves all other *beings*: And, for that reason, Aristotle says, they have more of *entity* in them than other things ‡. Now, though *mind* be the principal thing in the *universe*, being the first mover and author of all generation and production, yet, as there are in the universe *material causes*, as well as *efficient*, *final*, and *formal*, it is necessary that they also should be considered as a part of the *first Philosophy*.

Metaphysics, therefore, being the knowledge of the universe, and of the first causes and principles of things, it must necessarily comprehend the knowledge of the first *cause* of all, that is, the *Deity*, or *Supreme Being*: And this is the subject of the highest part of it, called *theology*. But, as God is not to be known by us, except by his works, and, as we cannot ascend to the first *cause* otherwise than by the scale of inferior *causes*, the study of the *universe*, and the principles of it, must necessarily, by way of preparation to *theology*, be studied by the first Philosopher. And, accordingly, Aristotle having explained those principles in his book of metaphysics, concludes them with *theology*, or the doctrine of the first cause.

And now we see the whole extent of the science of *metaphysics*; for, though the proper subject of it be *mind*, separated from *matter*, such as, I hope, I shall demonstrate the Supreme *mind* to be, the great author,

† This is Plato's definition of philosophy: And it is explained by Ammonius in his commentary upon Porphyry's introduction, p. 5. in the same way that I have explained it; that is, to denote the knowledge of all things; for, says he, by *divine*, is meant things eternal and unchangeable; by *human*, things changeable, and in generation and corruption.

‡ Metaphys. lib. 2. chap. 1.

author, and first *cause* of all things ; yet, as that *cause* cannot be recognised but through inferior and subordinate *causes*, metaphysics must necessarily comprehend the knowledge of these, as well as of the first *cause* ; and, therefore, in its full extent, may be defined, ‘ The science of the *causes*, and *principles* of all things existing ;’ of *mind* chiefly, as being that which is principal in the *universe*, and the first *cause* of all things, and likewise of whatever else may be called a *cause* or principle, though inferior and subordinate to *mind*.

From this definition, it is evident, that this science is justly entitled *universal philosophy* ; first, because its subject is the *universe* ; and, secondly, because it explains and demonstrates, as far as they are capable of demonstration, the principles of every other kind of philosophy, and of all arts and sciences ; for the principles of nature must necessarily be the principles of every art and science. It may therefore be said to be the *science of sciences*, as comprehending, in some sort, all other sciences. It is called also, as we have said, the *first philosophy*, from its rank and dignity in nature among the other sciences : But, from the order in which it must necessarily be learned, it is commonly known by the name of *metaphysics* ; which appellation, as I have observed, is taken from the title of Aristotle’s books where he treats of it ; for Aristotle himself does not call it by that name, (though I see his commentators of the Alexandrian school, and particularly the oldest of them, Alexander Aphrodisiensis, gives it that name,) but by the name of *σοφία*, or, as the Latins translated it, *sapientia* ; which was the only word the Latins had for philosophy, till about the time of Cicero, when they adopted the Greek word *philosophia*. In the introduction to his books of metaphysics, he has made a very fine encomium upon it, showing, that it has every property which can make one science more valuable than another : For it is the most universal of all sciences, being the knowledge of all things, as far as it is possible for man to know them, which can only be by general notions. It is the sci-

ence of *causes* more than any other, because it is the science of the first *causes*. It is the most difficult science, because it is most removed from sense and common apprehension: At the same time, it is the clearest and most accurate of all sciences, because it treats of things which are first in nature, though last in our conception; and which, therefore, are the simplest, or least compounded. And, further, it is, more than any other science, what every science should be to the human mind, valuable for its own sake, not for the sake of any utility, profit, or pleasure that it produces *. And, therefore, says Aristotle, it was not discovered till both the necessary and pleasurable arts were invented †. And, lastly, As the end of all philosophy is to know God, this philosophy, more than any other, answers that end; the chief subject of it, and that with which it concludes, being, as I have said, the knowledge of the first cause of all things.

Aristotle has observed, that *dialectic* and metaphysics are conversant about the same subject ‡. For, as *dialectic* does not treat of any particular subject, but argues from general topics, applicable to all subjects, it is the knowledge of *generals*, as well as metaphysics; but then it is a knowledge taken, not from the nature of things, but the opinions of men; and its principles are all assumed, none of them either self-evident or demonstrated: And therefore *dialectic* is not a science, like metaphysics, but rather a *faculty*, as Alexander Aphrodisiensis has very well observed, in his Introduction to his Commentary upon Aristotle's Books of *Topics*.

Aristotle has also observed §, that the sophistical art was conversant about the same subjects as metaphysics: For the *τὸ εἶναι* and the *τὸ μὴ εἶναι*, that is, *being* and *no being*; and the general principles and properties of *being*, were the chief topics of the sophists. And it was by captious and fallacious arguments drawn from thence, that they confounded men, and endeavoured to overturn the principles of all science and certainty. In order, therefore, to refute and silence them, the knowledge of this science was absolutely necessary.

B O O K

* Metaphys. lib. 1. cap. 2.

† Ib. lib. 4. cap. 2. pag. 871.

‡ Metaphys. lib. 1. cap. 1. in fine.

§ Ib. ibid.

B O O K II.

Of the PRINCIPLES constituting the UNIVERSE.

C H A P. I.

The Science of Metaphysics takes in the whole Universe, as it treats of the Causes and Principles of Things—These reducible to three Heads—Of Matter and Form—These easily distinguishable in Works of Art ; also in the Works of Nature—Of Matter—difficult to form an Idea of Matter—the same Difficulty with respect to Substance—Mr Locke's Notions concerning Matter and Substance—Whether the first Matter has a real Existence—Whether it has a separate Existence—Digression concerning the reality of Ideas—Distinction made upon that Head—Opinion of the Pythagoreans, Plato, and Aristotle, concerning Matter—Matter not to be perceived by the Senses, nor to be apprehended even by the Intellect, except by Analogy—No perfect Idea, or Knowledge of the Essence of any natural Substance.

IN the preceeding Book I have spoken of *being*, and its most general attributes, such as *motion, energy, action, passion, habit, power*, and the like ; and what I have there said may, I think, suffice for that part of the science which, by our modern metaphysicians, is called *Ontology*. This part of the work I consider as only preparatory to what is to follow ; for the proper subject of metaphysics is the Universe, and the first causes and principles of things ; and, among these, chiefly *mind*, which, as it is the *first cause* of all things, is, as I have said, the chief subject of metaphysics.

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The causes and principles of things may, I think, be fitly considered under three heads: *First*, The *constituting* or *elementary principles*, by which, and out of which, this universe is produced, such as, *change, motion, energy, action, passion, power, habit, faculty, matter, form, and mind*. All these may be reduced to two of the causes mentioned by Aristotle, viz. the *efficient* and the *material*; and, in the *last* thing I mentioned, viz. *mind*, is included the *final cause*. Under the *second* head, I consider *things* already *form'd* and *constituted*, and inquire into their nature, and those principles which make them what they are. All these fall under that kind of *cause* which Aristotle calls the *formal cause*. And, *lastly*, under the *third* head, I treat of those *things*, which, though they be not, properly, the causes of things * in the *universe*, are the necessary concomitants of them, such as, *duration, time, space, and place* †.

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* They are called by the commentators of Aristotle, *συμμετρεα*, being such things, which, though not causes, must exist along with the causes, otherways nothing could be produced.

† There are preserved to us two very valuable pieces of Pythagorean philosophy, that of Ocellus Lucanus, *περί του παντος*, and that of Archytas the Tarentine, bearing the same title. The first is, I believe, the most antient piece of philosophy in the world, of the authenticity of which we are sure. For the author was dead some generations, it would appear, before Plato, as is evident from the epistle of Archytas to Plato, wherein he tells him, he had got this work of Ocellus, among others, from his descendents. See what Gale, in his mythological works, has said of this author, in the preface to his treatise.

It is from him that Aristotle has taken his doctrine of the eternity of the world, his *fifth element*, and his notion of the transmutation of the elements into one another; and particularly the last, which he has laid down in his book *De ortu et interitu*, almost in the words of Ocellus; See Gale, *ubi supra*. And from him, and Timaeus the Locrian, both he and Plato have taken their notions of the *first matter*. Archytas, the other author, who writes also *περί του παντος*, was a contemporary of Plato; and it is from that work of his that Aristotle, as I have elsewhere observed, has taken his book of Categories. These two authors, treating both of the universe, appear to have considered it under the two several views which I have proposed in the two first heads. For Ocellus, in his treatise, speaks chiefly of the *efficient* and *material causes*, by which, and out of which, all things in nature are produced, such as *matter* and *form*,
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To one or other of these three heads may be reduced all the general principles of this science, of which I propose to treat in this first part of my work ; and, if these are well explained, I hope the application to both nature and man, will appear not very difficult, at the same time that it is productive of great and important consequences.

As to the *first* head, under which I treat of the *efficient* and *material causes* of the universe, and what may be called the *elements of nature*, I have already anticipated several things falling under it, such as *motion, change, power, habit*, and the other things mentioned above, which I thought necessary, in order to make my definition of *body* and *mind* more intelligible ; and, particularly, I have been very full upon the subject of *motion*, without the knowledge of which, it is impossible, in my opinion, to know what either *body* or *mind* is. I now proceed to speak of *matter* and *form*.

That these are the elements of all natural substances, and that the whole visible world is a compound of these two, is a philosophy, I believe, as antient as any ; for, it is not only the philosophy of Plato and Aristotle, but we find it laid down in that most valuable piece of genuine Pythagorean philosophy already mentioned, viz. *Timæus* the Locrian his treatise *De Anima Mundi* ; and I have no doubt that Pythagoras brought it with him from Egypt. That there is, in the works of art, a distinction betwixt *matter* and *form*, and that every piece of art is a compound of these two, every man, who knows the meaning of the terms, will admit. Nor is it possible, I should think, to deny that the works of nature are compounded in the same manner ; for example, that every animal and vegetable substance has

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and that *principle* which is always *active*, and that which is always *passive*. Whereas Archytas, in his treatise, speaks of what I propose to consider under the second head, viz. the general principles of things already constituted, which he reduces to certain classes, called *Categories*.

a certain *form* belonging to it, which makes it what it is, and also *matter*, with which this *form* is incorporated.

It is also admitted by all the modern, as well as antient philosophers, that this *matter* may be reduced to certain elements, of which it is composed, such as *earth*, *water*, *air*, and *fire*, which, on that account, are called the *elements*, by way of eminence. But the antients did not stop here; for the great difference that I observe betwixt the antients and moderns, in matters of science, is, that the antients did generalize more, and carried their investigations as far as possible, upon every subject; and, accordingly, they have carried the analysis of body farther than the elements. For, observing that these elements changed into one another, and run an eternal round of transmutation*, they were thence led to suppose, that there was something common to them all, and that *fire*, *air*, *earth*, and *water*, were all the same *matter*, but under a different *form*.

But what is this *matter*? Is it *body*, of which we have talked so much? It is not; for *body* is the compound of *matter* and *form*.

What

* Milton has most beautifully described this successive change of the elements, in Adam and Eve's morning hymn.

"Air, and ye elements, the eldest birth

"Of Nature's womb, that in quaternion run

"Perpetual circle, multiform; and mix

"And nourish all things; let your ceaseless change

"Vary to our great Maker still new praise."—

Par. Lost, B. 5. v. 180

And it is from this Proteus-like appearance of the elements, that Plato infers that there is something besides *earth*, *air*, *fire*, and *water*, which assumes all these different appearances. And we are told by the antient authors whom Mr Harris quotes, in his Philosophical Arrangements, page 81. that the Fable of Proteus is an admirable type of the transmutation of the elements; and it is to be observed, that it is a very antient fable, as antient as the days of Homer, not the invention, therefore, of the later Greek poets and mythologists, nor, I am persuaded, of Homer himself, but probably brought from Egypt by Orpheus, or some other mystagogue; for it very much resembles the symbols of the Pythagoreans, which undoubtedly came from thence; only the dress of it is more poetical. See the Verses of Homer and Virgil; also Mr Harris, *ubi supra*.

What is it then ? It is, what is called by the philosophers of Europe, who, about an hundred years ago, took the trouble to study the antient books of philosophy, the *first matter*, and is wittily ridiculed by Hudibras, under the appellation of *matter undressed*. And it is truly *matter void of form* *, as our more grave and philosophical Poet calls it, without any of those qualities that we ascribe to body, such as hot, cold, moist, dry, and even without the three dimensions, that is, without extension, which includes all the three : For, as I have already observed †, they are nothing else but extension in different directions ; before and behind, which is what we call *length* ; to right and left, which we call *breadth* ; and up and down, which is *depth*.

That our modern philosophers should have no idea of this *matter*, and should treat it as a vain, airy notion, and no more than a dream of Aristotle, and other antient musty philosophers, is not to be wondered, when Mr Locke, our great author of the philosophy of *mind*, has said expressly, that he has no idea of *substance*, the very first of the Categories, the doctrine of which is esteemed, by all those who have studied the antient philosophy, to be the very elements or chatechism of philosophy. At the same time, Mr Locke thinks that he has very clear ideas of different qualities inherent in substances. Now, I would ask Mr Locke, How he comes by these clear ideas ? Is it not by abstraction ? And is it not a more violent abstraction, if I may so speak, by which qualities are abstracted from a substance in which only they can exist, than that of the substance from the qualities, seeing the substance can exist, without, at least, any particular quality. But Mr Locke speaks so confusedly and ambiguously of abstract ideas of every kind, that it is plain he doubted whether there was any such operation of the human mind as abstraction. And as, through his whole book, he confounds ideas and sensations, it is plain that he had no notion of the mind's having any perception, except by the senses, nor knew that it could operate by itself, without the assistance of the body or its organs ; that is, in other words, he did not know what an

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idea

* Milton Par. Lost.

† See above, page 7.

idea was, though he has written a whole book upon the subject; and has given us a system of the philosophy of mind, without making the distinction, which is the foundation of that whole philosophy, betwixt the mind operating by itself, and operating by the assistance of the senses: And, because the mind must of necessity at first operate by the means of the senses only, he has from thence rashly concluded, that it can never operate in any other way*.

But, whether Mr Locke had any idea of substance, or not, it is evident, that there must be something in which the several qualities of substance are inherent; for we can very well conceive, abstracted from any substances, such qualities as *hot, cold, moist, dry, bitter, sweet, round, square*, and the like, and still there will remain something, which we call the *substance* of the thing, that is, the *substratum* for all these qualities. Now, it is only carrying abstraction further, and separating from this substance even extension and figure of every kind, and then we have remaining this *matter* of the antient philosophers.

I will give another illustration from mathematics, which, perhaps, will be better understood, as all our natural philosophers profess to be mathematicians, and some of them are really learned in that science. No man, who is not a professed sceptic, and does not set himself up, out of wantonness or vain ostentation of superior parts, to dispute the clearest truths, will deny that we have clear ideas of the subject of geometry; for, otherwise, there could be no certainty in that science. Now, the subjects of geometry are the boundaries of bodies, viz. *points, lines, surfaces, and solids*: For a point is the termination of a *line*, a *line* is the boundary of a *surface*, and a *surface* of a *solid*. Therefore, a *solid* is defined to be that which has three dimensions, viz. *length, breadth, and depth*; a *surface* what has two, viz. *length* and *breadth*; a *line* what has

* See what I have further said on this subject in the Origin and Progress of Language, vol. 1: book 1. chap. 4. in the beginning.

has only *length*; and a *point* what has no dimensions at all. If, of these, we have clear ideas, as every body must allow who admits the certainty of mathematical knowledge, we must admit that we have at least some idea of that which is thus bounded and extended different ways: For it is of necessity that a thing should be different from its bounds, and that there should be something which is thus limited and described by certain dimensions. Here, therefore, we have found what we were seeking, *matter* without its dimensions, that is, without extension, which is the very first *form* that matter assumes. And here also we may learn, in passing, to distinguish the different subjects of *geometry* and natural philosophy; for the subject of geometry is the boundaries of *body*, not *body*; whereas the subject of natural philosophy is *body*, with its dimensions, and all its other natural affections.

It may be asked, Whether this *matter*, without dimensions, or any other quality of *body*, does *really* exist? and my answer is, That it has a real existence, as much as its dimensions or boundaries, and as much as any other quality of *body*.

If any one is surprised that I give a real existence to a thing that appears so chimerical as *matter* without *extension*, let him ask himself, Whether he does not give a real existence to the wax, without the *figure*? Now the *figure* is nothing but extension bounded.

If it be further asked, Whether it has a separate existence by itself, distinct from all the qualities of *body*? my answer is, That we have no idea of it existing separately*, because we find no such thing in nature, from which we draw all our ideas; but, whether there may not be

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such

* Ammonius, in Praedicamentis, pag. 62. quoted by Mr Harris in his *Philos. Arrangements*, page 85. says, that it is spoken of by philosophers as a thing having an existence distinct from *body*, in order to show more clearly the orderly generation of things, and their progress from one thing to another.

such a thing existing in the regions of infinite space, as *matter* without *form* and dimensions, is what I think no man can take upon him to decide.

Whatever is true of *matter* in general, will apply equally to the particular matter of each particular substance, and which I believe is meant by our modern philosophers; when they speak of the *substance* of any thing as distinct from its attributes: For, as to the *substantial forms* of the Peripatetics, they are quite different from the *matter*, as I shall afterwards show.

And here it may not be improper to observe, that the philosophers of this age have fallen into great confusion concerning *ideas*, by not making the proper distinctions; for some of them speak of *ideas* as existing only in the *mind*; others of them, as of things having a real existence in nature. Now, in one sense, neither of these opinions is true; in another, both are true. Ideas are undoubtedly the creatures of the *mind*, being formed by the *mind*, either from external objects, that is, the objects of sense, or from reflections upon its own operations: And therefore, in as much as they are only the operations of the *mind*, they may be said only to have an existence in the *mind*. But we ought to distinguish betwixt the *idea* and its *object*: For, tho' the *idea* be only in the *mind*, the object of it may have a real existence out of the *mind*. And this is the case of all the *ideas* we form from natural objects. But there may be likewise *ideas* formed from nothing that is to be seen in nature, by which I mean, that the mind may connect together particular *ideas*, which it has formed from natural objects, (for all our *ideas*, as I have said, are from nature,) into one complex form, which has no existence in nature, such as, the *idea* of a Hippocentaur, or whatever fancy or fear has conceived,

“Gorgons, and Hydras, and Chimeras dire.”

Such

Such ideas are what the schoolmen call *entia rationis*; and both these, and their objects have no existence except in the mind. If Mr Locke had made this distinction, he would not have fallen into such confusion and contradiction concerning ideas, or *abstract ideas*, as he calls them; sometimes supposing them to have a real existence, and sometimes not.

The next thing to be considered is, Whether the objects of our ideas, being such as have a real existence out of the mind, have also a separate existence, as we conceive them, or whether they do not necessarily exist in something else? For, I suppose every philosopher is so much of a logician as to understand this distinction, with which Aristotle begins his logical work *, betwixt what exists by itself, and independent of other things; and what exists in another thing, without which it cannot exist; or, in other words, betwixt *substance* and *accident*. Now, the accidents of substances have no separate existence by themselves; and, as they cannot exist without the *substance*, neither can we conceive the matter of any substance existing without the *accident*: So that there is nothing which has a separate existence out of the mind, except our ideas of natural substances, taken with the matter in which they exist; and, accordingly, in this way, as Aristotle has told us, all natural substances ought to be defined †. These distinctions, properly made, would have prevented a great deal of confusion and contradiction, which our modern philosophers have run into, concerning ideas.

But, to return to *matter*, which the reader will observe I distinguish from *body*, of which only I have treated in the preceeding part of this work; for *body* is *matter sensible*; that is, with those qualities which make it perceptible by our senses. What appears to have
given

* See Aristotle's categories, cap. 2.

† Aristotle's metaphysics, lib. 6. cap. 1.

given the antients the idea of this universal *matter*, is the transmutation of the elements into one another *. This made them suppose, that there was one common subject of all these changes, which received the contrary qualities producing these changes. Plato, in the *Timæus*, page 1059. *editio Ficini*, speaking of these changes, says, that the appearances of the elements are so different, and the transmutation of the one into the other so quick, that we cannot, with certainty, say, that any one of them is what we call it, *fire, air, earth, or water*, but we ought to say that it is like one of these; and he explains the matter by a comparison: For, says he, suppose a man takes a piece of gold, which he fashions into various forms, such as triangles, and other figures, if he shows you one of these, and asks you what it is? the safest answer that you can make, is, That it is gold: For, if you say that it is a triangle, while you speak, the figure may be changed. Of this kind, says he, is *matter*. You cannot say it is any *one thing*, yet it is not *nothing*; for it is undoubtedly *something*, and so much *something*, that without it nothing could exist, at least of the visible world: For it is that which receives all impressions; and, like a piece of wax, takes off every *form*, but itself has *none*. There are, therefore, continues our author, three things in nature, *that* which is produced, *that* in which it is produced, and *that* from whence it is produced, and whose likeness it is; or, in other words, the *pattern* and *archetype*. This he has copied, and indeed all the rest of the philosophy of this dialogue, from *Timæus the Locrian*; who, in his treatise of *the soul of the world*, says, that all things are *three*, viz. *idea*, *matter*, and *body*, or what is sensible, and produced of the two first †; meaning by *idea* the *pattern* or *archetype*, (or *form*, as it is frequently called, both by Plato and *Timæus*) and which mixes with, and moulds and fashions the matter in a manner wonderful and inexpressible.

* See Ocellus Lucanus, page 513.—518. in Gale's opuscula mythologica.

† Τα δὲ ἑμπάντα, ἰδέαν, ὕλην, αἰσθητὸν τε, οἷον ἐκγεγεννηται, *Timæus Locrus*, page 1089. *editio Ficini*. Here we are to understand, that *Timæus* is speaking of the world as it exists and is constituted, and of the *matter* of which it is made, not of the great first cause of it, of which he speaks afterwards, as distinct from all these three.

fible. And the Locrian compares, as Plato does, the *idea* to the father, the *matter* to the mother, and the visible *world*, and all its various forms, to the children.

This is the opinion of Plato, and the Pythagorean philosophers, concerning *matter*: And, as to Aristotle, it is evident, that he has taken his natural philosophy, as well as Plato, from the Pythagoreans, though he has disguised it, and enlarged it much more: For it is from them that he has taken his notion of the eternity of the world, of generation and corruption, and of the *first matter* among other things *; for he has made *matter* and *form* to be the principles of all natural things, to which he has added *privation*. This appears not to have been reckoned by the Pythagoreans among the principles of things; nor indeed is it properly one, as I shall afterwards observe; but they knew that it was necessary for the production of natural substances, which I shall prove in its proper place.

But, how are we to conceive this strange being, if it may be called a being at all, what has no determined existence, nor is any one thing? Is it by the senses? It is not; for Plato tells us expressly, that it is not to be seen, nor apprehended by any of the senses; and it must be so, not being the visible world, but that out of which the visible world is produced. Or, is it to be apprehended by intellect? Neither can this be; for the object of intellect is the *idea* or *form* of which *matter* receives the impression. But, how then come we to have any notion of it at all? It is, says Timaeus, and after him Plato, λογισμῷ ὅτι, *by a bastard kind of reason*; not by any direct conception of it, says Timaeus, but by analogy †. And Plato says, (ibid. page 1061.)

* Lib. 1. physic. cap. 8. *versus finem*. See also metaphysics 2. page 106. Editio Silburgii, quoted by Mr Harris in his Philosophical arrangements, page 178.

† Τῇ μὲν κατ' εὐθυμίας νοεῖσθαι, ἀλλὰ κατ' ἀναλογίαν. See this very accurately explained by Mr Harris in his Philosophical arrangements, page 75. *et sequen.* where he shows that we have a notion of this primary *matter*, both by abstraction and analogy.

1061.) that, while we are in this state of existence, flumbering, and as it were dreaming, we cannot see the truth of things, except by shadows and images, as we see them in our sleep. And the truth is, that we know not the substance or essence of any of the works of nature, but only some of their qualities or properties. For example, all that we know of any animal or vegetable is, that it has such or such qualities, and by these we define it. But what is the substance of it, and what is the hidden essence of it, producing all those visible qualities, we cannot tell; and yet, it is evident, that, without knowing the essence of a thing, we cannot give a proper definition of it. It is therefore true what I have observed elsewhere *, that it is only our own ideas that we can properly define. And so much for *matter*; by which it is always to be understood that I mean the first *matter*, as it is commonly called, in contradistinction to *body*, which is *matter with form*; and I proceed now to speak of this *form*.

CHAP.

* Origin and Progress of Language, 2d edit. vol. 1.

C H A P. II.

Description of Form—Substantial Forms of the Peripatetics explained—Form not perceived by our Senses, nor even by the Intellect, otherwise than by Analogy—That Analogy explained—Forms really existing in Individuals, but not separated from Matter, except in the Mind of some intelligent Being—We have no clear Idea of either the Matter or Form of natural substances—All human Knowledge only by similitudes and resemblances—Privation not a separate Principle of Nature, but included in Matter—Matter and Form the Elements of Nature—joined with Extension they form Body—with the addition of Figure, Body becomes not infinite—certain Qualities being further added, Matter becomes the Elements—What these Qualities are—A principle of Motion further necessary to make a physical Body.

FORM is that of which *matter* is the receptacle; and it is not only the outward shape and figure of the thing, according to the common acceptation of the word, but it is that which makes the thing *what it is*, and gives it not only its name and denomination, but its nature: In short, it is the *essence of the thing*, from which result not only its figure and shape, but all its other qualities. It is called by Plato and the Pythagoreans, the *idea of the thing*; but it is not such an idea as we have of any natural substance, that is, an idea abstracted from *matter*, and containing only visible and tangible qualities of the subject, but an idea of a much higher order, such as we must suppose in the *mind* of the Deity, if we believe the universe to be the production of *mind*. It is distinguished by the Peripatetics from the ideas that we form by abstraction, by the name of *πρὸ τῶν πολλῶν*, that is, ideas existing before the individuals in which they are incorporated,

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and.

and from which they are, by us, abstracted. But, in the language of Plato, and the Pythagorean school, they are called simply *ideas*.

These ideas are, if I mistake not, the *substantial* or *essential forms* of the Peripatetics, so much exploded, and even ridiculed by our modern philosophers, but which I think must necessarily have an existence, not only in the mind of the Deity, where all things exist, but in every natural substance; tho' I hold it to be impossible that we can have any direct or immediate comprehension of them, any more than we have of the *matter* of such substances. But, as we can have some idea of the *matter* from analogy *, so, in the same manner, we may have some notion of this *internal form*, which constitutes the essence of all natural substances; and this notion we derive from the analogy of our own ideas, which we form by abstraction from material substances. By this operation of the mind, we create a species of beings, the *essential forms* of which we perfectly know; whereas, the essence of the works of God we can never perfectly know in this state of our existence. For example, the essence of any material triangle, whether of earth or stone, or of whatever other matter, I never can know; but when, from the earth or stone I abstract the figure of a triangle, and form the idea of it without the matter; of this being, thus created by myself, I know perfectly the essence, and define it to be 'a figure bounded by three lines.' This is the essential form of a triangle, from which all the properties, that Euclid has demonstrated of it, result. Now, in the same manner, I say, that, of every natural substance, every *animal*, for example, and *vegetable*, there is a *form* from which result all the properties of this animal and vegetable, such as *figure, size, colour, &c.*; all which are perceptible by our senses; but the *internal form*, from which they all result, is not perceptible by our senses, nor even by our understanding, directly and immediately, nor otherways than by the analogy I have mentioned.

* See the preceding chapter.

Another

Another example may be given, and which comes still nearer to the case of animal and vegetable substances, and that is, from the works of *art*, such as a *clock*, or any other machine. There the artist must necessarily know the *substantial* or *essential form*; that is, those parts of the machine which are principal, and produce all the movements,—in short, make the thing what it is. That such a *form* does really exist in the works of *nature*, as well as in those of *art*, is evident from this, that there could not be otherways any principle of union in natural substances, but all their several qualities would be independent one of another. Now, we cannot suppose this imperfection in the works of God, or that any thing made by him is less perfect than the beings created by us, such as the works of human art, and our ideas of mathematical figures, which we see virtually comprehend all their properties, they being, from those ideas, all deducible.

And, in these *internal forms*, we may observe all the differences of *genus*, *species*, and *individual*, that we see in the *visible form*: Of animal, for example, there is one *form*, which we may call the *generic form*. Certain additions to this *form* make the *specific form*, or *form* of each species of animals; and certain other additions constitute the *form* of the particular animal of any species; so that, in every individual animal, there really exist all the three *forms*; whereas the *generic* and *specific forms*, separated and abstracted from the individual, exist only in idea.

If the same question be asked here that was asked before with respect to *matter*, Whether *form* has any real existence separated from *matter*? my answer is, That, according to the philosophy of the *Licæum*, it has not; and that, without *matter*, it is a mere idea, existing only in the mind of an intelligent being; but, according to the philosophy of the *Academy*, it has a real existence separated from *matter*, out of the *mind* of any intelligent being. Of this, more afterwards.

From what is here said, it is still further evident, that what I observed was true, 'that' we have no perfect idea of any natural substance: For it now appears, that we have no distinct comprehension of the *essential form* of any such substance, any more than of the *matter*. Nor is this to be wondered at; for, in the *first* place, it is impossible that we can perceive by our senses this *internal form*, any more than the *matter*, divested of all the qualities which affect our senses. And, *secondly*, It is as impossible that either of them should be perfectly comprehended by our intellect, unless we could suppose, that the ideas of our *minds* are as perfect as those of the *Divine*.

If this wanted any further proof, it is evident from the way in which we form definitions of any such substance: It is from qualities of them which are perceptible by our senses; for it is a combination of a certain number of such qualities, united together in a certain *matter* as a *substratum*, which constitutes our ideas of all natural substances. Now, what are these qualities? They are no other but qualities which the natural substance has in common with those of the same kind and those of the same species: For, though definition is very properly said by Aristotle to consist of the *genus* and the *specific difference*, yet that specific difference is no other than the *qualities* which every individual of the species has in common with other individuals of the same species, in the same manner as the genus is constituted of all those qualities which the individual has in common with those of the same genus. So that the qualities which constitute the species, are called *differential qualities*, only because they distinguish the species from other specieses of the same genus; for, in reality, they are all similitudes; and the truth is, that the intellect perceives nothing but by similitudes, as I have elsewhere observed*. Now, every individual substance, besides what is common to other things, must

* Origin and Progress of Language, vol. 1. book 1. chap. 6. page 68. 69. 70. and 71.

must have something peculiar to itself, which makes it what it is, and nothing else, and is the foundation of all its *idiomatical* qualities, as they may be called, by which it is distinguished from every substance of the same species : And, when we add to all this, that those similar qualities of natural substances by which we define them, are only such as affect our senses, and which, therefore, are superficial, and far removed from the internal structure of the thing, it is perfectly evident, that we can have no idea of the *essential form* of any such substance : And, indeed, it must be obvious to common sense, that it is impossible I can know the essence of any individual thing, by only knowing that it resembles other things in certain qualities which affect our senses ; and what is true of individuals, must necessarily be true of genera and specieses, since it is from individuals that we form our ideas of them.

And here again we may see the justice of Plato's observation above quoted, ' *That*, in this state of our existence, we see things only as in ' a dream ; ' for we see not the substance of any thing, but only shadows as it were, or likenesses and resemblances. And it may serve to justify a method of reasoning which he frequently uses, and particularly in the *Timæus*, from images or similitudes ; for all our ideas are truly nothing more than similitudes, denoting the likeness that one thing has to another.

And so much for *form*, the other principle of natural bodies. To these Aristotle has added a third, which he calls *στεινσις*, or *privation*, an addition that he has thought proper to make to the Pythagorean and Platonic philosophy, in order to give his system the appearance of novelty ; but without any necessity, as I apprehend ; for it is not a *cause*, as he himself admits, such as *matter* and *form*, but is only that without which the first *matter* could not receive the impression of any *form* ; for it must be clear of every *form*, which is what he calls *privation*, before it can admit any. Now, this is necessarily implied

in

in the notion of *matter*; for, as it has the *capacity* of all *form*, so it has the *privation* of all *form*. In this way Aristotle himself has explained the nature of *matter* in the passage above quoted from the first book of his Physics, cap. 8. *versus finem*. And Plato, in the *Timæus*, has very much insisted upon this quality of *matter* as absolutely necessary, in order to fit it to receive all forms; and he illustrates his meaning by a comparison: Those, says he, who make unguents or perfumes, prepare the liquid so, to which they are to give the perfume, that it may have no odour of its own. And, in like manner, those, who take off an impression of any thing upon any soft matter, clear that matter of every other impression, making it as smooth as possible, in order that it may better receive the figure or image intended. In like manner, says he, *matter*, in order to receive the specieses of all things, must have in itself the species of nothing*.

The principles, therefore, of which all natural bodies are composed, are two; viz. *matter* and *form*; the one of which is the *material cause*, the other the *formal*; and both are inherent causes, called by Aristotle *ἰνυπαρχοντα*, existing in the thing-itself; whereas, the other two causes, viz. the *efficient* and the *final*, are *external*, or without the thing. They are also called *elements*, being that of which the thing is composed, and that into which it is ultimately resolved†; so that all *elements* are *causes*, but all *causes* are not *elements*‡.

X Of these two elements of nature, the one is perfectly simple, admitting of no variation in itself; I mean *matter*. The other is of great variety; and there is a progression in it worth observing. The first form that matter assumes is *extension*, by which its parts become contiguous, that

* Τούτων οὐκ αἰτιὰ τὰ τῶν πάντων αἰεὶ τὸ οὐτὸν, κατὰ τὴν ἑαυτοῦ, πολλακίς ἀφομοιωμένα καλῶς πολλοὶ διχρόθαι, πάντων ἐκτὸς αὐτῶν πρῶτη καὶ πεφικυῖται τῶν εἰδῶν. Platonis Timæus, pag. 1060. edit. Ficini.

† Metaph. lib. 5. cap. 3.

‡ Ibid. lib. 14. cap. 4. See also Mr Harris's Philos. arrangements, page 92.

that is, joining to one another, and having one common boundary. Extension, as I have said, is threefold, *length, breadth, and depth*, which are called the *three dimensions* of *body*, and which I have already explained.

This is the first step of nature's progress in the formation of things; for *matter*, extended into these three dimensions, becomes what we call *body*.

Again, if *body* were infinite, there would be no *figure*; for *figure* is *body* bounded and limited: *Figure*, therefore, is the second step of this progress of nature*.

But *matter*, thus extended and bounded, though it be *body*, is not *physical body*; in order to make it that, the addition of certain qualities is necessary, and then it becomes one or other of the four elements, commonly so called, *earth, air, fire, water*; which are so called, because they are the only elements that, as far as we know, have any existence by themselves: For we have hitherto discovered nothing that is not either *earth, air, fire, or water*, or resolveable into these.

It is, as we have said, by the addition of certain qualities, that *matter* extended and figured becomes the four elements. But, what are these *qualities*? They are, according to the doctrine of antient philosophy, *opposites*, such as *heat* and *cold*, *moist* and *dry*, *dense* and *rare*, *heavy* and *light*. These, in that fragment of antient Pythagorean philosophy which I have so often mentioned, *viz.* Ocellus Lucanus, are reckoned among the principles of nature; the four first of which, according to Ocellus, constitute the *first physical bodies*, and the four last, *secondary physical bodies*; which, according to him, are *rough* or *smooth*,

* See what Mr Harris says further upon these different forms which matter assumes; cap. 5. Philosophical Arrangements.

smooth, hard or soft, thick or thin, blunt or sharp; so that, according to this philosophy, there are sixteen qualities of *body* in all *. But, as these qualities are all included under *form*, I think it is not necessary to make them separate and distinct principles of nature. And, accordingly, Ocellus, when he mentions them, does not speak of *form* at all; but says, that *they* and *matter* constitute the first physical bodies, which we call *elements*: At the same time, I think it proper to observe, that these qualities do chiefly, if not altogether, make the *form* of natural bodies.

These contraries, of which the nature of things,

—— “*rerum concordia discors*,”

is undoubtedly composed, shew the evident necessity of some *first matter*; for, as these contraries succeed and give place to one another, and, as it is impossible, according to Ocellus's observation †, that contraries can change into one another, there must of necessity be some common subject in which the contraries exist successively, and which, by that succession, suffers a change ‡.

But,

* Gales's opuscula mythologica, p. 518. *et seq.*

† Ibid p. 519.

‡ That the universe is made up of contraries, and this its harmony, to speak in the language of musicians, most wonderfully varied by discords, is a fact that may be easily proved by *induction*. Ocellus Lucanus, we see, has endeavoured to reduce to numbers these discords, making in all sixteen of them. And Aristotle, in the 5th chap. of his first book of Metaphysics, mentions some other Pythagorean philosophers who numbered ten combinations of opposites, such as *finite* and *infinite*, *even* and *odd*, *one* and *multitude*, *right* and *left*, *male* and *female*, &c. And though we cannot intirely trust what Aristotle has said of the opinions of the Pythagoreans, we are sure, at least, from the Philebus of Plato, that they made the finite and the infinite two of the principles of nature; and indeed it is evident, that all the qualities of substances, such as *hot* and *cold*, *moist* and *dry*, are, by their nature, infinite; and, if the finite were not applied to them, that is, if they were not so tempered and measured that they might consist together, no substance could subsist. And it is in this sense, as I imagine, that the Pythagoreans made *number* the principle of all things.

But, further, *matter* thus extended and bounded, and, by the accession of certain qualities, become one or other of the first elementary bodies, is not yet a *physical* body, according to Aristotle's notion, without the addition of another thing, *viz.* a principle of *motion*, which, according to this philosopher, is essential to all *physical* bodies. And this, no doubt, is agreeable to the phaenomena of nature; for we see no *body* in this universe that does not of itself move one way or another, without any external impulse. And this leads me to the third great principle of things, the first in dignity and in the order of nature, being the *efficient cause* of every thing that exists in the universe, and the author of all beauty, order, and regularity:

Nec sine te quidquam dias in luminis oras

Exoritur, neque fit laetum aut amabile quidquam *.

For *mind* is the real *celestial Venus*, the true *Goddeſs* of the philosopher.

F

CHAP.

* Lucretius in proœmio.

C H A P. III.

The definition of Mind further explained.—Proved, that nothing can move itself—That Mind does not move itself—What is meant by Organization and Organs.

MIND I have defined to be that which *moves*, *body* that which *is moved*. And, if the distinction betwixt what *moves* and *is moved* be real, the distinction betwixt *mind* and *body* must also be real.

That there is a distinction, in idea at least, betwixt what *moves* and *is moved*, cannot, I think, be denied. But it may be said, that the distinction is only *ideal*, and that, like many other of our notions, it does not apply to the nature of things, at least, not universally; for that even the philosophers who assert the existence of *mind* as distinct from *body*, and particularly Plato, define *mind* to be that which *moves* itself, and, consequently, both *moves* and *is moved*. Now, if *mind moves itself*, why may not *body* do the same? and, if it does, then there is an end of the distinction I have made betwixt *mind* and *body*.

This argument is the foundation of the whole system of materialism. For, if *matter* has not in itself the *active* power of *moving*, as it has undoubtedly the *passive* capacity of being *moved*, it is impossible that those material philosophers, who maintain that there is no-
thing

thing in the universe but *body*, can ever account either for the beginning or continuation of *motion*. It is, therefore, an argument that deserves to be very maturely considered, since, according to my apprehension, without this distinction betwixt what *moves* and *is moved*, the system of Theism cannot be established upon solid philosophical principles.

What it is that *moves* body, whether it be a *principle*, *internal* or *external*, whether it be other *body*, or what I call *mind*, in contradiction to *body*, I am not now to inquire. All I propose at present is to show, that the *moving principle*, whatever it be, is distinct from that which *is moved*; and this I propose to prove; *first*, By an argument *a priori*, that is, from the nature of the thing; and, *2dly*, By induction from particular instances, which the phaenomena of nature, as well as the works of art, afford us.

The first kind of proof arises from the nature of *moving* and *being moved*. That there is a relation betwixt these two, nobody can deny; and the relation is no other than that of *action* and *passion*; for, to *move* is to *act*; to *be moved* is to *suffer*, or to *be passive*.

Thus much is evident to common sense; but there was a philosophy among the antients, first discovered in the school of Pythagoras, and afterwards adopted by Aristotle, which more fully explains the nature of this thing we call *relation*. This philosophy, very little known at present, but of which I shall treat more at large in the sequel, is a great branch of the science of *universals*; the subject of it being the most general ideas, comprehending under them all other ideas, and, by consequence, containing the principles of all things in the universe. These universals it ranks and distributes into certain classes, ten in number, called, in the language of the Greek philosophy, *categories*, but commonly, among us, *predicaments*; a word we have taken from a bar-

barous translation, made by the schoolmen, of the Greek word into Latin. One of these is *relation*, the nature of which is, that the *relatives*, or things related, necessarily refer to one another, so that the relation betwixt them cannot be conceived, unless both exist. Relatives are, therefore, a class of beings which have no separate or independent existence each by itself, but which necessarily depend upon one another for their existence *.

From this account of relation, it is evident, that it must necessarily be betwixt two things at least †; for, if we could conceive the same individual thing related to itself, then the things of this category would be no longer dependent upon other things for their existence, but would have each a separate and independent existence. And, further, it is necessary that the two things related should exist together; for, if we could conceive one of them existing separately, it would have an independent existence, and be no longer a relative thing ‡.

To

* Therefore, says Aristotle, in the beginning of his chapter upon this category, (cap 7. of the book of categories), things related are always expressed with reference to one another; Προς τι δι τα τοιαυτα λεγεται, ὅσα αὐτα ἄπὲρ ἐστίν, ἑτέρων εἶναι λεγεται, ἢ ὁπωσούν ἄλλως πρὸς ἑτέρον. And again, a little after, he says, πρὸς τι οὐν ἐστίν, ὅσα αὐτα ἄπὲρ ἐστίν, ἑτέρων εἶναι λεγεται. Ἡ ὁπωσούν ἄλλως πρὸς ἑτέρον, οἷον ὁρὸς μίγα λεγεται πρὸς ἑτέρον, πρὸς τι γὰρ μίγα λεγεται τὸ ὁρὸς. καὶ τὸ ὁμοίον, τίτι ὁμοίον λεγεται, καὶ τὰλλα δι τα τοιαυτα ὁμοιωτὸς πρὸς τι λεγεται.

† This is the reason given by Ammonius, in his commentary upon this chapter of the book of categories, fol. 94. for the plural name given to this category, both by Archytas and Aristotle, viz. τα πρὸς τι; for, says he, it is a *relation* or *habitude*: Now, says he, a *relation* cannot be conceived but in two things at least. Τα πρὸς τι σχέσις τις ἐστίν, ἡ δὲ σχέσηις τουλάχιστον ἑνὸςτι πρᾶγματι θεωρεῖται, διὰ τοῦτο πληθυντικὸς ἐπεγερψι.

‡ —ὅσα δι τα πρὸς τι ἅμα τῇ φύσει εἶναι, καὶ ἐπὶ μὲν τῶν πλείστον ἀληθὲς ἐστίν. ἅμα γὰρ δι-πλεσιον τε ἐστὶ καὶ ἡμῶν, &c. After this, he proceeds to state an objection to this rule in the instances of ἐπιστάτων and ἐπιστήμη, *what is to be understood*, and *what understands*; and αἰσθητὸν and αἰσθησις, *what is sensible*, or *perceived by the senses*, and the *senses*,

To illustrate this by some examples :—In the relation of *double* and *half*, it is evident, that there must be two distinct things ; for the same thing cannot be the *double* of itself and the *half* of itself : And, further, it is evident, that they must exist together, or not at all ; for, if there be a *double*, there must be a *half* ; and, if there be a *half*, there must be a *double*. Again, in the relation of *father* and *son*, every one must conceive the persons to be distinct, and to exist together ; for, if there be not a *father*, there cannot be a *son* ; and, if there be not a *son*, there cannot be a *father*. In like manner, in the relation of *understanding*, and the *being understood* ; what understands must necessarily be distinct from what is understood ; and the one cannot be conceived to exist without the other. Also, if there be that which *desires*, there must be a different thing which is *desired* ; and the two must necessarily exist together. Likewise, if there be an *agent*, that is, a thing that *acts*, there must necessarily be a different thing, that is *patient*, or *acted* upon ; nor can we conceive the one to exist without the other : And, for the same reason, if there be that which *moves*, there must be a different thing that is *moved* ; and, wherever the one is, the other must necessarily be.

And

senses, or that which perceives. All which, he says, may exist separately and independently one of another. But Ammonius, his commentator, has answered this objection most satisfactorily, page 110. by making the obvious distinction betwixt the things related, and the relation betwixt them ; for the things related may subsist separately, and altogether independent of one another ; but the relation betwixt them cannot exist, unless the things related exist both at the same time. Thus, for example, the mind or the understanding has undoubtedly a separate existence from the object of the understanding, or the thing understood. But the relation betwixt them cannot exist, unless they both exist at the same time. The same is true of what is perceived by sense, and the sense itself. And, in like manner, what moves, considered by itself, has a separate existence, distinct from what is moved. The human mind, for example, is, by its nature, and considered in itself, distinct from the body which it moves ; but the relation betwixt the two, by which the one *moves*, and the other *is moved*, cannot exist but in conjunction with them both.

And thus, I think, I have proved that, where any thing *is moved*, there must be necessarily something that *moves* it, and which must be different from what *is moved*. Nothing, therefore, can *move* itself; so that, when we see a thing *moved*, we must necessarily conclude that there is something which produces the *motion*, either internal or external with respect to the *thing moved*, and different from that *thing*. And, when we say, that a thing *moves itself*, an animal, for example, we can mean nothing else, if we understand what we say, than that there is an internal principle in the body of that animal, which moves it.

It is to be observed, that this argument, from the nature of *relation*, does only apply to *body*, and to *local motion*, but not to the higher sort of *mind*, which I call *intellect*: For *that* mind is so distinguished from every thing else in nature, by the faculty of *reflection*, of which I shall say a great deal in the sequel, that it is an exception from the general rule that I have laid down concerning this category of relation; for, by means of that faculty, it becomes its own object, and reciprocates upon itself. *Intellect*, therefore, contemplates itself, understands itself, desires itself: And the *Supreme Intellect* we conceive to have no other object but itself; and therefore it is said to be *all in all*.

There are, I know, who will not be convinced by arguments of this kind; and indeed they are not to be understood, except by such who have been a little accustomed to abstract reasoning, which I am afraid is not the case of many now a-days who call themselves philosophers: For they are so much conversant with individual things, and observe and experiment so much upon objects of sense, that they have hardly any conception of *universals*: And, if they have learned no more of the philosophy of *mind* than what is taught by Mr Locke, they will not believe that *universals* have any existence. But, as nothing can be proved, except by arguments, either *a priori*, or *a posteriori*; if they

they be not convinced by the proof I have given *a priori*, they ought the more to attend to that which I am now to offer to them *a posteriori*, that is, by *induction* from particular examples ; which I hope will make the distinction betwixt what *moves* and *is moved*, obvious to the most unphilosophical of my readers.

Whether this distinction obtains in bodies inanimate that are *moved*, or whether it takes place even in other animal bodies, may not be so obvious to some of those readers ; but, that it takes place in their own bodies, they must know, from the most certain of all knowledge, consciousness ; for, when they raise up their arm, they know certainly that it is not the arm that moves itself. If, indeed, they have any knowledge of anatomy, they will know that this *motion* is performed by the machinery of muscles, sinews, and bones : But they must know, with equal certainty, that these do not *move* themselves, but that they are *moved* by an act of their will : So that here the distinction must be acknowledged, betwixt the *moving power* and the *body moved* : And thus, in one work of nature, at least, we are perfectly sure that the *body which is moved* does not *move itself*.

As to the works of art, every man, though he be not a mechanic, but has only common sense and observation, must make a distinction betwixt the *moving power* of any machine, and the *weight* that is *moved* by it.

Now, this distinction being thus established, from these particular instances, both of nature and of art, it must be extended from analogy to every body that is in *motion*, unless some good reason can be given to the contrary. That this analogy will go to the bodies of other animals, as well as man, will hardly, I think, be denied ; but it cannot stop there, but must go on to every other body that is in *motion*, whether vegetable, or what is commonly called inanimate ; and we must
say

say likewise of them, that what *moves* them, be it internal or external, *mind* or *matter*, is something different from them.

As to what is said of *mind moving itself*, I have already shown in what sense *mind* can be said to *be moved**: And it is evident that it cannot be said to *be moved* in the sense in which *body is moved*: For *local motion*, as I have shown, is essential to all the *motions* of *body*. Now, if *mind* be immaterial, indivisible, and without parts, as I hope in the sequel to demonstrate it to be, it is incapable of *local motion*; and, if it cannot be *moved*, it is evident that it cannot *move* itself; for, to *be moved*, and to *move*, as I have said, are relatives, which must exist together, or not at all.

As to Plato's definition of *mind*, it is, as shall be shown in the next chapter, inaccurate in the expression. And indeed, although, according to that general and most comprehensive definition of *motion* given by Aristotle, inferior minds may, as I have observed, be said, in a certain sense, to *be moved*, when they change from a state of rest to a state of action, or from one energy to another †, it were to be wished that the term which, in all senses, is applicable to *body*, and which, even by philosophers, is commonly applied only to *body*, should never be applied to *mind*; but that we should call those changes to which it is liable, its *actions* and *energies*, not its *motions*; and should say, that it is, by its nature and essence, *active*, and that it *suffers* only by its connection with the *body*.

And here we have again that distinction made by some antient philosophers, quoted above †, betwixt *mind* and *body*, viz. that the one *acts*, and the other is *acted* upon; a distinction which runs through all nature, and is the fundamental principle, in my apprehension, of the system of the universe. It is true, indeed, that *body* seems to *act*, as well as to *suffer*; but then it acts only as the *instrument* of *mind*, and cannot, in strict propriety, be said to *act* any more than the *lever* that moves

* See page 21.

† Ibidem.

‡ Page 31. 32.

moves the stone, or the *tool* used by the artist *. For, in common language, we say that it is the *man* who *moves* the stone by means of the *lever*, and the *artist* who operates upon the subject of his art by his *tools*.

Of what nature this *moving power* is, what sort of substance it is, or what properties belong to it, I determine nothing at present; but I think I have said enough to establish the distinction that I have made betwixt *body* and *mind*; and, to show that, as *body* certainly is *moved*, and yet cannot *move* itself, there must be in nature some other *moving principle*, which is what I call *mind*. And I will only further add, that, where, in the works of nature, the *moving principle* is internal, and appears to act not immediately, but by the intervention of a certain mechanism, the construction, arrangement, and disposition of the several parts of the body necessary for that purpose, is called *organization*; and those parts, by means of which the motion is performed, are called *organs*.

Such bodies as are moved by an internal principle, without any external impulse, are commonly said, but not with philosophical propriety, to *move themselves*. But nothing, as I have shown, can *move itself*: And the principle of *motion* in them, though internal, is as distinct from the *body moved*, as if it were external †. This internal

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principle,

* To this purpose Proclus, in the second book of his Commentary upon the Timæus, Πάν δὲ το. ποιῶν ἀσώματος ἐστὶ, καὶ γὰρ σώμα ἢ, δυνάμει ἀσώματος ποιεῖ. "Every thing that *acts* is incorporeal; for, though it be *body* which *acts*, it is by *incorporeal powers* that *it acts*." When, therefore, we see one body moving another, though it be *body* which immediately produces the *motion*, it is not of itself that it does so, but by *incorporeal power*, that is, by *mind*, which gives it the *motive power* that it communicates to other bodies.

† Aristotle, in his Physics, particularly in the 8th book, cap. 4. speaks much of the τὰ ὑφ' αὐτῶν κινούμενα; but it is plain, from what he says there, and elsewhere, that he only means, by that expression, those things which have the principle of motion internal: And that he believed that, in every thing, what *moves* is different from what

principle, or *mind*, as I call it, is in all bodies; and the only distinction I make is, that, in some bodies, such as the animal and vegetable, it operates by organs, in others, it operates immediately, and without the intervention of any organs, at least, such as we can discover *.

A like impropriety of speech we use, when we say, that *mind moves itself*, which necessarily supposes that it is *moved*; whereas, in the sense of *bodily motion*, of which only I must be understood to speak, it is impossible, as I already observed, that it can *be moved* †. We ought, therefore, to say, if we would speak properly and philosophically, that *mind acts*, and is, by itself, excited to *action*. And, instead of saying, that it is *moved*, we should say that it *suffers*, though even that be not from its own nature, but from its conjunction with *body* ‡.

C H A P.

is *moved*, is evident; for he concludes the chapter in these words, πάντα αὐτὰ τὰ κινούμενα ὑπὸ τινος κινεῖται. And, in the beginning of the next chapter, he makes the same distinction that I do betwixt the *moving principle* operating immediately by itself, or by the intervention of another thing, ἡ γὰρ οὐ δι' αὐτὰ το κινεῖται, ἀλλὰ δι' ἕτερον ὃ κινεῖ το κινεῖται, ἡ δι' αὐτὰ.

* See the preceeding note

† Aristotle, in his first book, De Anima, employs a chapter (chap. 5.) to prove that the mind cannot *be moved*, and consequently that it cannot be said to *move* itself, which he concludes with these words ὅτι μὴ οὐκ ἔστι τι κινηθῆναι τὴν ψυχὴν φανερὸν ἐκ τούτων· ἢ δι' ἑλπὴς μὴ κινεῖται, δηλοῦντες οὐδ' ὑφ' ἑαυτῆς.

‡ See this proved by Aristotle, in the chapter above quoted.

C H A P. IV.

Aristotle's Definition of Mind—Shown not be sufficiently comprehensive in two respects—Also not sufficiently particular—Plato's Definition of Mind—This also imperfect in two respects—The Definition above given the true Definition—agreeable to the Opinion of Plato and Aristotle, and of the Philosophers before them.

THE only definition that Aristotle has given of *mind*, in general, is, that it is the *entelecheia*, or *perfection*, of a physical organized body*; and, from what he says, in another passage of the same book, by *perfection*, he means the *form*, or *εἶδος*, which is no doubt what gives *perfection* to every thing. As, therefore, every thing existing is either *matter* or *form*, or what is compounded of these two, that is, the *natural substance*, *mind* (for so I translate the word ψυχή) is one of these three, viz. the *form*. And this definition, no doubt, as far as it goes, is a true definition; for it is evident that *mind* is the perfection, and that which gives the *form*, and constitutes the essence of every thing in which it is inherent. And it is true what Aristotle says afterwards†, that *mind* is so much the principle of the *body* in which it exists, that it is a *cause* of that *body*, in three different respects. *First*, it is, as we have said, the *formal cause*, making the thing what it is, whether animal or vegetable. *Secondly*, it is the *final cause*, being that for the sake of which the body is formed and organized, and without which it would be of no use. And, *lastly*, it is the *efficient cause*; for it is the *motive power* of the body, by which all its energies and operations

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rations

* *De Anima*, lib. 2. cap. 1. ἡ πρώτη ἐντελεχεια σωματικῆς φυσικῆς, οργανικῆς. By πρώτη ἐντελεχεια he means, according to the explication I have given of these words above, the perfection of power, or habit, not of actuality or energy. See above, page 19.

† Ibidem, cap. 4. pag. 634. Editio Val.

rations of every kind are produced: So that it is, in every respect, a *cause* and *principle*, excepting only the meanest and lowest *cause*, viz. the *material*.

I have, however, several objections to this definition. In the *first* place, I think it is not comprehensive enough, as it leaves out the highest and most excellent kind of *mind*, that which is abstracted from all *matter*, not in idea only, but in reality, and, by consequence, the *Supreme Mind*. For this is not only implied, and indeed expressed, in the definition, but Aristotle has told us, that he so meant it, and commends the ‘opinion of those philosophers who thought that *mind* was ‘neither *body*, nor without one; for, says he, it is not *body*, but something belonging to *body*; and therefore it exists in *body*, and in such ‘or such a *body*, not in any *body*, as some of the antients thought*.’ By this we are not to understand that Aristotle believed that no *mind* existed separately from *matter*; for he has asserted the contrary in most express terms, and has made Theology, or the doctrine of *mind* separate from *matter*, the conclusion both of his physics and metaphysics:—Or, that even the intellectual part of our *mind* did not exist separately from *body*: Though I observe, that one of his interpreters, Alexander Aphrodisiensis, was of that opinion; against whom Johannes Philoponus disputes, and shows the contrary from many passages which he has collected†; but one, I think, is sufficient, which is to be found in the 3d book, chap. 4. *De Anima*, where he says expressly, ‘That the animal, or sensitive part, cannot be without *body*; but the *intellect* is, by its nature, separated from *body*‡.’ Aristotle, therefore, is as far from being a materialist as any philosopher; but we are to consider that this book, *De Anima*, is a part of Aristotle’s Natural Philosophy, and a sequel to his books of General Physics §. In them,

* *De Anima*, lib. 2. cap. 2. in fine.

† See his introduction to his Commentary upon the books *De Anima*, and what he has said in his Commentary upon the 5th chapter of the first book.

‡ το μεν γαρ αισθητικον ουκ ανευ σωματος, ο δε τους χωριστος.

§ In the introduction to these books *De Anima*, he says, δοκει δε και προς αληθειαν απασαν η γινωσις αυτης (ψυχης) μεγαλη συμβαλλεισθαι. μαλιστα δε προς την φυσικην, οτιν γαρ εισι μεχρι των ζωνων.

them, he treats of *mind* as a part of nature, and not as of a thing beyond or above nature. Now, in all natural substances, *mind* is ever joined with *body*; so that it did not belong to his subject to inquire concerning *mind* separate from *body*, which is the proper subject of metaphysics; and accordingly he has treated of it in his books of Metaphysics *. But, even in these very books *De Anima*, he has been at pains, as I have observed, to let the reader know his sentiments concerning the separate existence of the *intellectual mind*.

But, *secondly*, even as to *mind* united with *body*, his definition is not comprehensive enough; nor has he taken in all the natural substances upon which *mind* acts; for his definition, as he has explained it at great length, takes in only vegetable and animal substances. And yet all other *natural bodies* have a principle of *motion* in them; and accordingly, by that principle, as essential to them, he himself has defined a *physical body*. Now, this principle in *bodies*, by which, as he says, some ascend, some descend, and some are moved in a circle †, it is plain, from many passages in his works, he considered as distinct from *body*, as much as the principle that moves an animal or vegetable; and, in one passage, he has compared it to that principle in animals or vegetables, and says it is, as it were, a *life* in *body* ‡. He has not, however, thought proper

* Philoponus has made an apology for him somewhat different, in his commentary upon the words above quoted, from the end of the second chapter of the second book *De Anima*.

† *Arist. de Coelo*, lib. 1. cap. 2. See above, p. 9.

‡ Lib. 8. *De Physic. auscultatione*, cap. 1. where, speaking of the eternity of motion, he says, τούτ' ἀθάνατον καὶ ἀπαισέστον ὑπάρχει τοῖς οὐσι, διὰ τὴν ζῶν τῶν αὐτῶν, τοῖς φύσει ἐκινητοῖσι. And, in the beginning of the 4th book, *de Coelo*, he speaks of bodies that are light or heavy, having in them ζῆλον, ἢ τὴν κίνησιν, where that principle of motion in physical bodies which, in the other passage, he had said was a kind of life, he calls here an animating *spark* of motion; intimating, by these expressions, that the moving principle in these inanimate bodies, as they are called, is not so apparent as in the animate. But that it is truly in all, and of the very essence of a physical body, he has said in many places: And *nature* herself, according to him, is nothing else but this principle of motion in bodies, ἀρχὴ τῆς κινήσεως; and this he makes to be the difference betwixt the

per to apply it to the Greek word ψυχή, though it appears that Thales, the founder of the Ionian school, was not so scrupulous, but ascribed the *motion* of the attraction of the iron by the loadstone to *mind* or ψυχή.* And, in the same way, he, no doubt, accounted for all the other phaenomena of nature of the same kind.

Lastly, When he tells us that the *mind* is the *form* of an *organized body*, he tells us what is true, but he does not tell us enough; for he does not tell us in what this *form* consists: And it is, as if one should say, that the definition of any one thing was its *form*, without letting us know what the *form* is. Now, I have expressed, in my definition, what that *form* is, and have said, that it is a *motive power*; a definition, which, I think, most perfectly distinguishes *mind* from *body*, and comprehends every kind of *mind* from the highest to the lowest. And so much for Aristotle's definition of *mind*.

Plato's definition is, 'That *mind* is what is *self-moved*†;' thereby distinguishing it from *body*, which is either *moved* by *mind*, or by another *body*; for both Plato and Aristotle, and all philosophers, both antient and modern, who are not atheists, agree in this, that *body* cannot *move itself*. Against this definition of Plato, Aristotle has argued at great length, in his first book *De Anima*, cap. 3. where he maintains, not only that the *mind* is not *self-moved*, but that it is not *moved* at all. And he adds, that it is impossible, by its nature, that it can be *moved*. And, upon the supposition, that Plato meant *bodily motion*, in which sense Aristotle understands him, it is evident that *mind*, not being a

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the works of nature and those of art, that the former have the principles of motion in themselves, and the latter are moved from without; lib. 2. phys. cap. 1. And not only does this principle move, but it moves with design, and for a certain purpose, in the same manner as art moves the materials upon which it works. It is, says he, as if the art of ship-building was in the wood. This, he adds, is most manifest in the instance of a physician curing himself; for that is likest of all to nature. Lib. 2. Phys. cap. 8 *in fine*.

* Aristotle, lib. 1. De Anima, cap. 2.

† αὐτοκίνητος, the translation of which, according to the strict propriety of the word, is, 'capable of being *moved* by *itself*.'

material substance, cannot be moved, except by accident; as, when a man in a ship is moved, not by his moving, but by the ship's moving: Or, to give an example still more apposite, as, when rowers in a boat are moved themselves by the moving of the boat; for the mind moves the body as the rowers do the boat, and, by consequence, is moved itself. But Philoponus, in his Commentary upon this chapter, shows, I think, very plainly, that the difference betwixt the two philosophers is, in this instance, as in many others, only in appearance; and that Aristotle here has either misunderstood Plato, or affected to misunderstand him, which he says is often the case, that he might have the pleasure of refuting him *: For Plato does not mean here *motion*, such as that of *body*, but *motion* that is applicable to *mind*: For, according to Aristotle's own definition of *motion*, he shows that *mind* is *moved*, when it is changed from one *habit* to another; and, it may be added, when it passes from a state of rest to activity, or from one *energy* to another †.

But, even in this sense, I think his definition is not good; for, in the *first* place, it comprehends only inferior *minds*, not the *Supreme Mind*, in whom there is no change, nor shadow of change. Secondly, Whatever may be the case of *mind* separated from *body*, it may be doubted whether the movements or changes that happen to *mind*, while
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* Philoponus, in the passage above quoted, is very angry with Aristotle for mistaking the symbols of the Pythagoreans, used by Plato in the *Timaeus*, by which he makes the mind to consist of right lines and circles, for literal truths. The Pythagoreans, he says, not willing to publish their doctrines to all the world, at the same time, not pleased with the allegories of the poets, which not only cover the truth, but are apt to lead young minds into great and mischievous errors, chose other kinds of allegories, which they called *symbols*, and by which they concealed their philosophy from the vulgar, and, at the same time, did no harm to the ignorant. And, upon this occasion, Philoponus has given us a very ingenious explanation of those symbols, used by Plato to express the nature of the *mind*.

† See what I have further said upon this subject, in the chapter on *motion*, page 21.

united to *body*, do not as often proceed from the *body* as from the *mind*. Some of them, we are sure, do so ; and, indeed, *mind* and *body* are so united, that the one must necessarily affect the other ; sometimes the affection proceeding from the *mind*, and producing sympathetic movements in the *body*, as in the case of fear or anger, or such like passions ; and sometimes proceeding from the *body*, and producing sympathetic emotions in the *mind*, as in the case of pain.

It is evident, therefore, that Plato's definition is imperfect, and will not apply to what I call *mind* ; *first*, in respect that it does not comprehend the *Supreme Mind*, which may be called the *Mind* of *Minds* ; and, *secondly*, because it does not apply to all the movements and changes of inferior *minds*, many of which do not proceed from the *mind* itself, but from the *body* with which it is united. It would therefore have been better, as I observed in the preceeding chapter, if Plato had not applied *motion* at all to the *mind*, which he certainly did not believe to be *corporeal* ; and, instead of saying that it was *self-moved*, had said it was *self-active* ; and I have no doubt but that was his meaning.

From this examination of the definitions given of *mind* by Plato and Aristotle, it appears, I think, still more evident, that the definition I have given is the true one, being liable to none of those objections, to which the definitions, both of the master and scholar, are liable. And it appears, from the account which Aristotle has given us of the opinions of the philosophers before his time concerning it *, that they all agreed in making the *power of moving* one, at least, of the principal attributes of *mind* : And the latest of them, Anaxagoras, did, as he informs us, define *mind* by that *power* only. But, says he, they imagined that it not only *moved*, but *was moved* ; because they said, that every thing here below, that *moved* other things, was also *moved* itself.

* Lib. 1. (De Anima,) cap. 2.

itself. And in this, according to him, consisted their error ; not in making the *power* of *moving* the characteristic of *mind* ; for, it is evident, that he believed *mind* to be the Author of all the *motion* in the universe ; but it was *mind immaterial*, and, by consequence, *immoveable*. As to Plato, he has made, in the passage above quoted *, the very distinction that I have made, betwixt *body* and *mind*, and has expressly said, that *mind* is what *moves itself*, and every thing else ; and *body* is what is *moved*. And Proclus, the best interpreter of Plato, and who, in later times, was alone dignified with the name of his successor, in his Commentary upon the Timaeus, book 2. page 90. has said, that *body* is, by its nature, *ἡσυχάζοντος*, that is, incapable of moving itself ; and further, that it is unable to adhere or keep together. It is therefore kept together, as well as moved, by something else. And this something, which *moves body*, and keeps it together, must be an active principle : But, whatever is *active*, is not *body*. It is, therefore, *ἀσχηματιστός*, or *immaterial*, that is, *mind*.

Thus, it appears, that all the antient philosophers, however much they may have differed concerning *mind*, in other respects, agreed in this, that it was the principle of *motion* : And indeed, I think it is impossible to find any thing else, that the three kinds of mind, which they comprehended under the term *ψυχή*, had in common : For the *vegetable* life has certainly nothing else in common with the *animal* and *sensitive* ; nor either of these two with the *intellectual*. And, as to the fourth kind of *life*, or *quasi-life*, as Aristotle calls it, that is to be found in all bodies ; it is nothing else but this *motive power*, in different directions, according to the different natures of the bodies.

* See page 9.

C H A P. V.

Other Minds besides the Rational or Intellectual.—The Brute Mind—The Vegetable—That which moves unorganized Bodies—As great Varieties of Minds as of Bodies—The Scale of Nature not otherwise compleat—Mind not degraded by animating unorganized Bodies—The wonderful Operation of these Bodies in Nature—The Animal and Intellectual Life the Subject of the present Inquiry.—Of the Animal Life—Sense, Appetite, Pain, and Pleasure, necessary for the Preservation and Continuation of the Animal Life—The Phantasia also necessary for the Animal Oeconomy—The Mind, excited by the Assistance of the Phantasia, and the consequent Appetites, moves the body, not directly, but by the intervention of certain Machinery—All Animals must have Senses, one or more, and also the Phantasia—Difference betwixt Aristotle and his Commentators on this last Point—Six differences betwixt Sense and Imagination—Memory does not belong to the Animal Nature—A certain degree of Ratiocination, or Comparison of Perceptions, belongs to some Brute Animals of the better Kind.

AS, therefore, according to the opinion of all the antient philosophers who were not Atheists, it is *mind* that moves, *body* that is moved; and, as all *bodies* are in *motion*, or have a tendency to be moved, it is evident that there must be *mind* every where in the universe. It is therefore an *universal* of the first order, as universal as *matter* and *form*, and more universal than *body*; since there is *mind* without *body*, but no *body*, as far as we know, without *mind*.

I know the general opinion is, that *thought* and *intelligence* are essential to *mind*, and that it is only what thinks and understands that deserves

deserves the name of *mind*: Such, I know, is the common use of the word in English, though I have shown above*, that, as the Greek philosophers had more extensive views of things than we, so their philosophical language was more comprehensive; and therefore they had a word ($\psi\chi\eta$) which expressed, not only the human mind, but likewise the internal principle of the brute animal and the vegetable, perceiving, betwixt these, a relation and conformity, which, it appears, our modern philosophers do not perceive, or, at least, do not attend to. But, without disputing about the use of words, let me ask the philosophers of this age, Whether there be not something within the brute, as well as within the man, which moves the one as well as the other? All the philosophers of Britain, at least, will admit that there is; and, if so, I think it not improper to call by the same name the internal principle, which produces the same effect in both, however different they may be in other respects; for it is by what they have in common, that we class things under the same *genus*, and call them by the same *generic* name, however different they may be in *species*. Thus, we call by the same name of *animal*, creatures very different from one another, because they have in common what belongs to the general idea of *animal*. Again, there are *motions* in the vegetable, which cannot be accounted for from any external impulse, such, particularly, as the motion of the juices upwards. These motions, therefore, must likewise be produced by some internal principle, by which the vegetable is nourished, grows, and propagates its kind, as well as the animal. And this principle of movement, although the movement be not so various as that of the animal, I call by the same generic name of *mind*. Again, those movements of the bodies called *inanimate*, by which some *move* one way, some another, some in a straight line, some in a circular; as they have not hitherto been accounted for by any material impulse from without, and, I firmly believe, never can, I must likewise ascribe to some internal principle, which, having that general characteristic of *mind*, of producing *motion*, I call by the same general name of *mind*.

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* See page 8.

If it be said that, in this way, I make a great variety of minds, differing much from one another in their qualities and properties, and of degrees of excellence very different, my answer is, that I admit the truth of the observation ; but, I say, that my system is, for that, the more agreeable to the general analogy of nature, of which the variety is infinite, and the fulness and perfection as great as the variety ; for it is well said, by one of Aristotle's commentators of the Alexandrian school, ' That the universe is the *complement* of all *forms* or *specieses* *,' containing in it all the possible specieses of things. Every thing, however, in it, is either *body* or *mind*. But, of *bodies*, what prodigious varieties do we see, and how different from one another in kind, in beauty, and in excellence ? How much more perfect is the *organized* body, than a lump of *unorganized* brute matter ? Among *organized* bodies themselves, how much more delicate the structure, and accurate the conformation of one than of another ? And, among the *unorganized*, what a wide interval betwixt the subtile electric fire and the massy rock, the diamond and the clod ? and how many different kinds, and different degrees of excellence, lie betwixt these extremes ? Now, nature would be imperfect, and, as it were, mutilated, if there was not, at least, the same variety in what is principal in nature, *mind*, that there is in *body*, which is so much inferior in dignity and excellence.

And here it may be observed, how full and compleat, according to my system, the scale of nature is in this matter of *mind*, and how it arises, by just degrees, one step above another. First, there is that *mind* which simply moves *body* in a certain determined direction. This is the lowest kind of *mind*, of least variety and excellence, and below what the antients called ψυχη or *life* ; yet it is essential, according to Aristotle, to a *physical body*. Next to that is the *mind* which moves the vegetable with much greater variety, producing, by its various motions, the nutrition, growth, and propagation of the plant : This is what is known by the name of *the vegetable life*. Next to it is the

animal

* πληρωμα εστι των ειδων ο κοσμος, Joannes Philoponus's introduction to his commentary upon Aristotle's books, *De Anima*.

animal life, producing still greater variety of motion ; for it has sensation superadded to the vegetable life, by which the animal *perceives*, and has communication with objects external. And, last of all, comes *intellect*, which is essentially distinguished from the other three, by *consciousness* ; for none of the other three knows what it does ; whereas intellect recognises itself, as well as other natures *.

It may be thought that I degrade *mind* very much, when I bring it so low as to make it move even *unorganized* bodies : But, in doing so, I think I only fill up the scale of nature. That scale certainly would not be compleat, if there was no *mind* below the human, as well as above it. Now, there is below it that of the brute, having many things in common with the human, as we shall afterwards see, particularly ratiocination, in a certain degree : But, would the progress of nature downward be compleat, if there were no mind below that of the animal ? I think it certainly would not ; and therefore there is the *vegetable life*. But still there is something even below that ; for there is movement in *unorganized* bodies, which cannot be accounted for from any mechanical cause. The progress, therefore, cannot end in the *vegetable*, and must go further down to every body that *is moved*, but further it cannot go.

Nor is the lowest kind of *life* useless, however contemptible it may appear, compared with higher *mind* ; but, on the contrary, by it, under the direction of *intellect*, is carried on the whole business of the universe ; for it is by the various motions of bodies, to or from one another, commonly known by the name of *attraction* and *repulsion*—by their motion downwards, or tendency to a centre, called, in the language of modern philosophy, *gravitation*,—by their motion upward, or from the centre, such as the motion of flame,—and by their

* The three first of these minds make what is called, in the language of antient philosophy, *nature*, in contradistinction to *man*. And the difference betwixt them and *man* is, that they act necessarily, without deliberation, not knowing for what purpose they act, nor recognizing their own operations ; whereas *man* acts with deliberation, without necessity, knowing for what purpose he acts, and conscious of his own actions.—But of this more afterwards.

their circular motion, or motion revolving into itself, that every thing is generated and produced, and the whole frame of nature preserved and sustained. And, particularly, it is to one of these motions, viz. the *attraction* of *cohesion*, that what we call *body* may be said to owe its existence; for it is by this principle that *body* is extended, and has the properties of solidity and impenetrability; and without it there could be no animal or vegetable, rock or mountain, or any thing elevated upon the face of the earth; for it is a power which overcomes even *gravitation*, making the inferior parts of any body adhere to the superior, when, otherways, by the power of gravitation, they would fall down towards the centre, and be spread into a horizontal surface, like a fluid*.

Aristotle, in the work I have so often quoted, has observed, that the vegetable life is the foundation of both the animal or sensitive life, and of the rational and intellectual; for, says he, if there was not that nourishment and growth which belongs to the vegetable life, there would be neither *sensation* nor *intellect* †, at least, incorporated with *body*, of which he must always be understood to speak in this work, *De Anima*; for it is, as I observed before, a part of his natural philosophy. And, in this respect, he compares the *vegetable life* to the triangle in plain rectilinear figures: For every rectilinear figure is resolvable into triangles; and, if there were no triangles, there could be no rectilinear figure ‡. But the same, with as great justice, may be said of this principle of cohesion, without which, there would be neither *vegetable* nor *animal life*, nor any kind of embodied *mind*, nor indeed any *body*, as I have already observed, since it is that principle which makes *body*.

To

* See, upon this subject, Baxter in his Enquiry into the Human Soul, page 64. See also Proclus in the passage above quoted, page 73. from the 2d Book of his Commentary upon the Timaeus, page 90. where he asserts the *spirituality* or *immateriality* of this principle of cohesion, in the following words, *παν το συνεκτικον πνευματικον εστι, παν δε το πνευν. ασηματον εστι*, 'Whatever keeps together acts, and whatever acts is incorporeal.'

† Lib. 2. *de Anima*, cap. 2.

‡ Lib. 2. cap. 3.

To explain more particularly the nature of the lowest kind of *life* which moves unorganized bodies, or of that which animates the *vegetable*, belongs to the second part of my work, in which I am to apply my philosophy of *mind* to the operations of nature: But I will here treat of the *animal* and *rational life*, as I think it is necessary to explain them, in order to make still more evident the distinction betwixt *body* and *mind*, which I hold to be the foundation, not only of the philosophy of *mind*, but of natural philosophy, of metaphysics, and particularly of the highest part of metaphysics, *theology*: For I hold it impossible to attain to the ultimate end of philosophy, which is the knowledge of God, without being able properly to make this distinction. Now, in the *animal* and *rational life*, the operation of *mind* is much more visible, being obvious to common sense and observation, than in the other two kinds of life: For, in the *animal* and the *rational life*, we know, from the most certain of all knowledge, namely *consciousness*, the operations of *mind*; and, by attention and observation of the structure of the *body*, we discover by what means it acts, and how it is acted upon.

I will begin with the *animal life*. All animals, as well as vegetables, must grow and be nourished: The former, because there is, by the order of nature, a progress from the *embryo*, or first rudiments of the animal, to its state of perfection: The latter, because it is formed of materials that are daily wasting, and therefore stand in need of constant repair; which repair is by the means of nourishment *. And it is by nourishment that the animal is not only preserved from death and dissolution, but it is by nourishment also, that it grows and comes to maturity. Now, it is from without that animals receive their nourishment; and sometimes they have to seek it at a considerable distance. In order, therefore, to be nourished, they must have some knowledge of external objects, and must be able to distinguish

* See Philoponus's introduction to his commentary upon Aristotle's books *de Anima*.

distinguish what is proper for nourishing them, from what is not. This they do by the means of what we call *sensation*; for which nature has provided five *senses*, and no more to any animal, judging these sufficient for the purpose both of *living*, and of *living well*. But, as she does nothing in vain, to some she has given fewer, their state of life requiring no more; but to all she has given one, viz. *touch*: For that is the sense which is the foundation of all the others, every one of them operating by the *touch*; and therefore, without that sense, there could be no sensitive nature. Sensation, therefore, may be defined, 'the perception, by the *mind*, of external objects, by the means of certain parts of the *body*, called the *organs of sense*.'

Further, all animals propagate their kind. And this, says Aristotle, is the chief concern of nature; for the intention of nature is to make every thing eternal, like its great Author, as far as their nature will permit *. Of some kinds of being, the individuals are eternal; but, as all cannot be so, there are others which are eternal only by succession; so that the species always continues, and is one and the same, though the individuals perish †. And by how much the species is of more value than the individual, so much the more care has nature taken to provide for the preservation of the species. And, according to Aristotle, it is for the sake of the species that she has provided for the individual ‡: Now, it is by generation that the species is continued.

But the care of nature for the preservation of the species, as well as of the individual, would be ineffectual, if there were not certain *impulses*

* Aristotle *de Anima*, cap. 4. lib. 2.

† Aristot. *ibid*.

‡ Aristotle, *ubi supra*. See also Philoponus in his introduction to his commentary on these books.

pulses of the *mind* of the animal, disposing him both to seek nourishment, rest, and whatever else is necessary for the *being* and *well-being* of the individual, and likewise to propagate his kind. These *impulses* arise from the objects which are presented to him by the sense: They are what we call *appetites*. And both that which prompts the animal to preserve the individual, and that which prompts him to propagate his kind, are expressed in Greek by the word *πρωιμυια* *; which, according to the account we have given of the animal constitution, must necessarily attend sensation, and therefore is essential to the *animal* or *sensitive* nature.

Again, as nature has been pleased to annex *pleasure* to the gratification of these appetites, in order to prompt the animal to gratify them, and to reward him, as it were, for obeying the call of nature; hence it comes, that *pleasure* likewise is essential to the animal constitution, and, by consequence, its opposite *pain*; for, wherever there is *pleasure* in the gratification of any appetite, there must of necessity be *pain* in the disappointment, or counteracting of that appetite.

Farther still, if there were no other *instinctive impulse* given to the animal, the purpose of nature would not be fulfilled ; for it is necessary, not only that the animal should provide for the individual, and likewise propagate his kind, but further, it is for these very purposes necessary, that he should defend himself, as far as he is able, against every thing that would hurt or destroy him, and that he should have a certain degree of resolution and perseverance in his pursuits. Nature, therefore, has given the animal an *impulse* or *movement* of the *mind*, by which he is prompted to encounter danger, to resist when attacked, and to overcome difficulties which may occur in the gratification of his appetites. This principle of the animal nature is expressed in

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* See Philoponus's commentary, *ibid.*

Greek by the word *θυμος* †, which we may translate into English, *anger*.

But the animal oeconomy would not be yet compleat, if nature had not bestowed upon us another thing, more wonderful, I think, in the eyes of the philosopher, than any thing I have yet mentioned. I have said, that the impulse, which excites an animal to supply his own wants, and to propagate his kind, is excited by the objects presented by the sense: But, suppose there is no object within the reach of sense proper to excite the animal to either, yet it may be necessary that the animal should seek for both. How then is this want to be supplied? and how is the animal to be prompted to seek for an object that the sense does not present to him? The answer is, That nature, by a wonderful contrivance, presents to the mind of the animal, and makes, as it were, a picture within him of the forms of those objects of the appetite of the animal, by which he is prompted to seek them as much as if they were really before him. This magic lanthorn of the mind, (for so I think it may be called), is, in Greek, expressed by the word *φαντασμα*, in English *imagination*, or *fancy*, by which the images of things presented to the mind by the senses are preserved; so that the perceptions of sense, which otherways would be fleeting and transitory, acquire, in this way, some kind of duration and permanency; and, by this admirable contrivance, the mind is moved from within as strongly, and sometimes more strongly, than by objects from without.

By these two impulses, proceeding either from real objects perceived by the sense, or from the pictures of them in the imagination, the animal is prompted to *act*, that is, to *move* his body, which is the instrument that nature has given him for supplying his wants: And it remains now only to be inquired, By what kind of mechanism the *mind* moves the *body*, and employs it in gratifying its appetites and supplying its wants?

That

† See Philoponus in his introduction to his commentary on the books *de Anima*.

That *mind*, incorporated with an *animal body*, does not move that body directly and immediately, but by a certain kind of machinery, is a discovery for which we are indebted to anatomy; for, by it we learn, that the *mind* moves the members of the *body* by a machinery of muscles, sinews, and bones, which perform the office of that mechanical power called a *lever*; but which, by a certain structure of the body, necessary for other purposes, is made to be of a kind that requires an extraordinary power to move it, far exceeding any power of human machinery that was to act in so small a space.

In different animals the structure of the body is different, according to the different appetites, inclinations, oeconomy, and manner of life of the animal. But, as to the machinery by which the *mind* of the animal acts upon the *body*, and, in that way, performs its natural functions, it is pretty much the same in all animals. And, with respect to the mind, it consists, in all animals without exception, of the parts above mentioned, *viz.* the *sensitive*, the *phantastical*, or *imaginative*, the emotion of *appetite* and *anger*, together with the sensation of *pain* and *pleasure*.

That the sensitive part is essential to the animal, and that there can be no animal without, at least, the sense of *touch*, is, I think, agreed by all philosophers. And Aristotle admits, that all animals have the feeling of *pleasure*, and, by consequence, the desire of it, or what I call *appetite* *. I think it is necessary too, that every animal should have a principle of self-defence, and a certain degree of fortitude, by which he resists dangers and overcomes difficulties, though I do not remember that Aristotle has any where said so expressly; but he has denied that all animals have a *phantasia*; and, particularly, he says, that ants, and bees, and worms, have it not †. But, in this, both his

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* Aristot. *De Anima*, lib. 2. cap. 3.

† Ibid. lib. 3. cap. 4.

commentators, Philoponus and Simplicius, differ from him; for they both agree, that all animals, even those mentioned by Aristotle, have it in some degree; and the way that Philoponus saves his author's credit is, by saying, that Aristotle means that the bee, for example, has not a *phantasia* such as the dog or horse, by which it can learn any thing, or is capable of discipline; but one of an inferior kind, by which it has only a confused and general perception of things, but which, it seems, is sufficient for the purposes of its oeconomy *. These commentators appear to me to be in the right; for the perceptions of sense, unless they were retained in the *phantasia*, would not be sufficient for the purposes of nature. An animal could not seek the food that nature has destined for him, without a picture of it in the imagination; nor could he find the way back again to the place where he found that food, unless the place was likewise painted in his *phantasia*. And, in many cases, it appears impossible, that an animal, without such help, could either propagate or rear the offspring. And, as to the bee in particular, it is evident, that, without some such inward directory, she could not, at any considerable distance, find her way back again to her hive, which, it is certain, she does. And, further, though there be a multitude of hives in the same place, so like to one another, that one should think it impossible to distinguish the one from the other, yet the bee never mistakes another hive for her own; and this shows not only that she has an impression of it on the *phantasia*, but a very accurate one. And, as to the authority of Aristotle, on the other side, he appears to me to have altered his opinion upon maturer consideration; for, in the 11th chapter of the 3d book *De Anima*, he says expressly, that there can be no desire or appetite without a *phantasia*. Now, without desire or appetite, there can be no animal. And he fur-

* Philoponus accuses Aristotle of contradicting himself upon this point, saying in one place, That all animals have the *phantasia*; in another, That some have it not. And he opposes ὁ παλαιὸς Ἀριστοτέλης τοῦ ὀνὸς Ἀριστοτέλης. See his commentary on the 4th chap. of the 3d book *De Anima*.

further says, in the same passage, that even the most imperfect animals, such as have but the single sense of *touch*, have appetite (*πρωκτα*) and likewise a *phantasia*; but, says he, an indefinite one, that is, as his interpreter Philoponus understands it, an obscure one, in which the objects are not distinctly represented *.

Further, all animals can distinguish the perception of one sense from that of another; for example, they can distinguish *sweet* from *white*, and either from *sound*. Now, this distinction cannot be made by any one of the five senses, which only perceive and distinguish their proper objects. Neither can this be done by *intellect*, supposing that all animals were possessed of it; because sensible and corporeal things are not the objects of *intellect*. At same time, it is evident, that a distinction must be made by some faculty of the mind, which perceives them both at once; for otherways it is impossible to compare them. Now, for this purpose, Aristotle has thought, that a kind of sixth sense was

* See the commentary of Simplicius upon this passage of Aristotle, page 86. where he very properly observes, that all animals appear to have a distinct *phantasia* of the *πρωκτα*, or what is *pleasant*; that is, what is proper for the nourishment of the animal and the preservation of the species. But some animals, says he, have no distinct *phantasia* where the nourishment is to be found; and, therefore, they have no distinct or determined progressive motion: And this appears to be the case of worms and flies. The imperfect animals, who have no progressive motion, and only one sense, have likewise a distinct enough *phantasia* of what is proper for their nourishment; for we see oysters, when they want nourishment, opening their shells; but, as they are confined to one place, and as they do not go to the nourishment, but the nourishment comes to them, they have no *phantasia* at all directing them to the place where the nourishment is to be found, or instructing them how it is to be sought for. Thus far Simplicius; to which it may be added, that, as nature does every thing that is necessary, but nothing more than is necessary, it would have been very superfluous to have given to worms or flies, which find their nourishment every where, a *phantasia*, as distinct and comprehensive as that of a horse or dog. And, as to those imperfect animals, which are fixed to one spot, it would have been altogether unnecessary to have given them any other *phantasia* than that which directs them to prepare for the reception of the nourishment when it comes to them.

was necessary, which he calls a *common sense*; because it has no particular object of its own, but perceives and compares together the objects of all the other senses *. But I agree with Philoponus, (in the end of his commentary upon the passage in Aristotle †), that this *common sense* and the *phantasia* is the same thing; for it is evident, that, by means of the *phantasia*, animals do, in other respects, compare their perceptions, and reason concerning them; and why not, likewise, in respect of their difference from one another? And the *phantasia* solves all the difficulties started by Aristotle concerning the manner of this perception, as, that it must be by one and the same faculty of the mind, and at the same instant.

Aristotle has been at great pains to distinguish betwixt *sensation* and *imagination* ‡. And his commentator Philoponus has enumerated, and very well explained, six differences that he makes betwixt the two. The first is, that, in dreams, we undoubtedly make use of the imagination, by which, and which only, they are produced. But, in dreams, the senses do not operate: Therefore, *sense* and *imagination* are different. The second is, that new-born children have the use of their senses, but no imagination; for proof of which, Philoponus says, that a child, at first, will apply for suck to any breast as well as that of its mother, and to any thing in the form of a breast, though it be of wood or stone. And, though he once burn himself in the fire, he will return to it again. Neither of which, says Philoponus, would happen, if the *phantasia* had retained either the image of the mother and her breast, or of the fire. The third difference Philoponus rejects, namely, that all animals have *sensation*, but all have not *imagination*. The fourth difference is, that *sense* is always conversant about things really existing; whereas, the objects of *imagination* are often things

* Lib. 3. *De Anima*, cap. 2. See also his commentators Philoponus and Simplicius upon this chapter, which appears to me to need a commentary very much.

† See also Philoponus upon the 4th chap. of book 3d, *De Anima*.

‡ Lib. 3. cap. 4. *ibid*.

things not existing; therefore, *sense* is alway true, *imagination* often false and deceiving. But this distinction, I apprehend, only belongs to the rational nature: For it is only man that is a *poet*, and makes, of the images in his *phantasia*, by joining and disjoining, arranging and compounding them together, pictures of things that have no existence in nature. But the brute has nothing of the *poetical* faculty; and, therefore, there is nothing in his *phantasia*, but the images of things really existing, such as he received them from his senses*. The fifth is, says Philoponus, the solution of an objection, rather than making a distinction of the two: For, when we see a thing at a distance, and do not see it distinctly, we say, *that we fancy we see it*; therefore, *fancy*, or *imagination*, is nothing more than a weaker or obscurer sensation. But, if this were true, says Philoponus, a more distinct vision would be a *more perfect fancy*; which is what no body will say. The sixth and last difference is, that, when our eyes are open, we see a colour, or any other object; but, when we shut our eyes, we only imagine it; that is, see it in the *phantasia*. And this last I hold to be the essential difference betwixt the two, that what we perceive by the sense is present, and operating upon the sense, whereas the object of imagination is not present. The consequence of which, is another *material* difference, very much to be attended to; because it applies to all the faculties of the mind; some of which operate on things without the mind, others on things within. Now, the imagination is one of the latter, and, in that respect, may be compared to *intellect*; and, accordingly, it is called by Aristotle *Νους παθητικός*, or *intellect passive*, as Philoponus informs us†. As to the dif-

* This, I find, is the opinion of Simplicius in his commentary upon the 4th chapter of the third book *De Anima*, fol. 60. of the commentary.

† The passage is in his introduction to his commentary upon the books *De Anima*. I will give the words, because they show that Philoponus makes the essential difference betwixt sense and imagination the same that I do. *Τῶν δὲ αἰσθητικῶν τῆς ψυχῆς δυναμειῶν, αἱ μὲν εἰς γινώσκαι· αἱ δὲ, ζῶνται καὶ οὐκ εἰσὶν γινώσκαι μὲν, φαντασία*

difference betwixt *imagination* and *intellect*, and the other internal faculties of the mind, (so I call them from the objects on which they operate), I shall observe that, when I come to speak of the *intellectual mind*.

The reader may perhaps be surpris'd, that I have not mentioned *memory* as one of the faculties of the *mind* belonging to the *animal* nature, especially if he has read what Aristotle has said in more than one place, viz. That other animals have memory as well as man *. But I observe, that, in his books *De Anima*, where he has treated more accurately than any where else of all the faculties of the *mind*, and particularly of the *phantasia*, as belonging to the *animal* nature, and not to man only, he no where mentions *memory* as being of that kind. And, in his book upon the subject of *memory* and *reminiscence*, though he speaks there of *memory* as belonging to other animals, he admits, that there is *memory* of ideas, as well as of sensible objects. But I incline to make a distinction betwixt *memory* and *imagination*; and, to say that *memory* is only of ideas, consequently belongs only to man; and that *imagination* is only of sensible objects, consequently belongs both to man and brute. And this opinion is supported by the authority of Plato in the *Philebus*, who expressly makes the distinction betwixt what is *written* in the *mind*, and what is *painted* in it †. Now, what is written, I call *ideas*; and *memory* is that part of the *mind* in which they are preserved, and as it were recorded; whereas, the *paintings* in the *mind* are the images of sensible objects, which indeed only can be

και αισθησις. διαφερουσι δε αλληλων αυται. οτι η μιν αισθησις προς το εκτος αποτηνεται. η δε φαντασια ενδοι εχει την γινωσιν η μιν γαρ αισθησις, το παρον μοτον και ου αντιλαμβανεται εξωθεν, τουτο οιδιν. η δε φαντασια, παρκα της αισθησις λαβουσα τους τυπους των αισθητων, εν εαυτη, τουτους αναπλάττει. οθεν και παιδαγγοι ρουν αυτην καλει ο Αριστοτελης ρουν μιν, ως ενδοι εχουσιν το γνωστων, και ωπλη προσβολη, ωσπερ εκνηος, επιβαλλουσιν, και ου δια καλίσκηνους παιδαγγοι δε, διωτι μετα τυπων και ουκ ασχηματιστως γιγνασκει. εκληθη δε φαντασια, διωτι φαντασια τις ουκ φαντασια γαρ ιστιν, η των φανιντων ομοσις. ιστηνι γαρ εν εαυτη τα εξω φαντασα.

* Lib. i. cap. i. Metaphys. Lib. de Memoria et Reminiscencia, cap. i.

† Pag. 388. editio Ficini.

be painted ; and the *repository* of them, I call the *imagination*. And I may quote Aristotle against himself from his book concerning *memory* ; for he there says, that *memory* necessarily implies a sense of *time*, and what is *first* and *last* : For, says he, every body that remembers any thing, says to himself, ' I knew this before.' Now, brutes have no idea of *time*, or of *first* and *last* *. And it is certain, that they have not *consciousness* or *reflection*, by which only they can review their own operations. At the same time, it must be admitted, that the *imagination*, in the brute, serves the purpose of *memory* in us ; for, whenever he sees the object that is painted in his *phantasia*, he knows it again, but without any perception of the time when he first saw it. I incline, therefore, to think, that *memory* belongs only to the rational nature, as well as *reminiscence*, which Aristotle acknowledges is peculiar to man †.

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* See Aristot. *de Anima*, lib. 3. cap. 11. and Philoponus's commentary thereon.

† Lib. *De Memoria*, in fine. See also Michael Ephesius's commentary upon this work of Aristotle, where, though he does not deny that the brutes have memory, he makes a distinction betwixt their memory and the memory of man, which I confess I do not understand : But I think it is evident, from the account he gives of memory, in his introduction to his commentary, that it is impossible that the brutes can have it : For he says, that memory is nothing else but the operation of the *phantasia* presenting the image of the sensible thing to the animal, with the addition, that, at such a particular time, the object was seen by the animal. Now, it is, I think, impossible that the brute can have that recollection, and, therefore, upon him the power of the *phantasia* can only operate in presenting to him the object just as he saw it at first, without any addition of *time* : And very often we recollect things in the same manner ; for, having seen a man once, and so having a picture of him in the *phantasia*, I know him again, but without recollecting the time when I saw him. In such a case, I have only a notion of *duration*, or *time indefinite*, as it is called by Philoponus ; but none at all of *time definite*, or measured by the application of *number to motion* ; number being that which defines every thing. And this *definite time* is only what is, properly speaking, called *time*. See Aristotle in his books *De Coelo*, where he calls time *αριθμός της κινήσεως*. Now, it is certain, that the brutes have no notion of this kind of time, for this plain reason, that they have no notion of number. See what Philoponus has very well said upon this subject in his commentary upon the 10th and

11th

As to that degree of *reason*, or *faculty* of comparing their perceptions, which we see in some brutes, I think it is not common to them all, nor essential to the *sensitive nature*, but peculiar to some brutes of the highest order; but, as it is common to all men, and is an essential part of the constitution of the *human mind*, I shall speak of it in the next chapter, in which I am to treat of that mind.

11th chapters of Aristotle's 3d book *De Anima*. And here we may observe the difference betwixt the *phantasia* of the man and of the brute; for the *phantasia* of the man has very often the recollection of *time* joined with it, whereas the brute has no idea of *time*, but only a simple perception of the identity of the object, which he attains by comparing the object of sense now perceived by him with the image retained in his *phantasia* of the same object formerly perceived.

CHAP.

C H A P. VI.

The Importance, the Utility, and the Comprehensiveness of the Philosophy of Mind—The certainty of that Philosophy—The wonderful Chain in Nature by which the several Minds are connected together—The Human Mind begins where that of the Brute leaves off, the comparative Faculty—This the foundation of the Intellectual Mind—By it Ideas are formed—Progress of that Formation—Ideas, a simple Perception of the Intellect—But complex Perception necessary—The Nature of it, and of the Discursus Mentis—The Conclusion of that Process, either Science or Opinion—Difference betwixt the two—The last Operation of the Intellect, that by which it recognises itself.

THE knowledge of the *human* mind is of the greatest importance in philosophy ; for, if we know it, we must of necessity know *inferior* minds, the powers of which are all contained in the *human* : Nor can we attain to any knowledge of *superior*, but by some analogy or resemblance, which we may suppose they have to the higher faculties of our *minds* : So that the study of the human mind is, of necessity, previous to the study of the highest part of philosophy ; I mean *theology*. It is a study too of as great concern to us, as it is of importance ; for, what can be of greater concern to *man* than the knowledge of himself ? And the certainty of it is as great as the importance and utility of it : For the knowledge of our *minds* proceeds from the most certain cause of knowledge, *consciousness* ; by means of which, our knowledge of *mind* is much more intimate, and much more satisfactory to a philosophical inquirer, than our knowledge of *body*. But, certain as the science is, it is not without its difficulties, and therefore it requires much attention and accurate observation ; nor can we expect, after all, to have a perfect knowledge of the essence, even of our own *minds*, any more than of any other thing in

nature; though I think, by the intimate knowledge we attain of its operations, we may come much nearer to the knowledge of its essence than of that of *body*.

The doctrine of *mind* is no less comprehensive than it is useful and important. For, as *mind* is the cause of all *motion*, whatever is moved, that is, the whole universe, and all the various *moving* principles we see in it, belong to the philosophy of *mind*. These principles are so connected together, as well as every thing else in nature, that it is impossible to understand perfectly one kind of them without knowing likewise the other.

That mind, which pervades and animates the whole universe, and is the principle of that motion which is essential to all physical bodies, is the foundation, as we have seen, of all kinds of life, the *vegetable*, the *animal*, and the *rational*. In like manner, the *vegetable* is the foundation of the *animal*, and the *animal* again of the *rational*. So that there is no void in this part of nature, any more than in the corporeal; but every kind of life is inseparably connected with another, all hanging together in one indissoluble chain, and each supporting, or supported by the other. The consequence of which is, that, what is most perfect of *mind* embodied, must necessarily be joined with what is most imperfect. And they are so necessarily depending one upon another, that what is most perfect in the lower order of *minds*, is most imperfect in the order immediately above; but, at the same time, is the foundation of its greatest perfection. For example, what I observed to be the greatest perfection of the brute nature, and which brought it the nearest to humanity, namely, the faculty of comparing its perceptions, is the lowest of the *intellectual mind*; but, at the same time, *that*, without which, it could not perform its energies, nor be what it is, as I shall presently show.

The *rational*, or, to speak more properly, the *intellectual life*, being, as I observed, no more than a superstructure upon the *animal*; as I
concluded

concluded my account of that life with this faculty of *comparison*, so with it I will begin the account I am now to give of the *human* mind.

That the brutes possess this comparative faculty, at least in a certain degree, is, I think, evident; for they compare their perceptions, are often doubtful, and deliberate, and then act in consequence of a determination upon one side or other; which we may call an opinion that they have formed *. And here the *mind* of the brute acts by itself, without the assistance of the *body*, or its organs; for, it is certainly not the *sense*, nor even the *phantasia*, that compares, though they furnish the materials for the comparison, upon which the mind acts, as the statuary does upon the block of marble.

It was for this reason, that the antient philosophers, and particularly the Pythagoreans, did not deny *reason* to the brute; because *reason*, according to them, consisted in that faculty of comparison, which, as we have seen, the brutes possess: But, it is to be observed of these comparisons made by the brutes, that they are only of the perceptions of sense, either immediately and directly from the sense, or preserved in the *phantasia*. And, *secondly*, the brute makes these comparisons, only when he is incited by some bodily appetite,

* Aristotle, in the 11th chapter of his 3d book *de Anima*, seems to apply the word *δῶξα*, or *opinion*, to the brutes; for he distinguishes betwixt *opinion* formed from syllogism, which is the *opinion* of *intellect*, and belongs only to *man*, and that which is without syllogism. And his Commentator Simplicius, in his note upon this passage, page 87. says, that Jamblichus maintained that *δῶξα*, taken in the most general sense, applied to the determination of the *mind* of the brute; and that he made the same distinction expressly which I have said Aristotle seems to have made.

Though I have said above, that the brute *deliberates*, that is true only in one sense; for, having no idea of *good*, nor foreseeing consequences, he never deliberates, whether he should yield or not to any impulse from appetite, if there be but one impulse; but, if there be two different impulses, he must of necessity deliberate, which of them he shall follow: Whereas, man having the idea of *good*, and foreseeing consequences, *deliberates* in every case, where there is but one impulse from appetite, as well as where there are many; and therefore, I think, *man* may be called a *deliberating* animal, in contradistinction to the *brute*, who deliberates but seldom, and on particular occasions.—But this shall be more fully explained afterwards.

petite, or by some instinctive passion, either for his offspring, or the herd to which he belongs: And, the only use he makes of this comparative faculty, is for the preservation of the individual, and the continuation of the species. And, had mankind been intended for no other purpose, this kind of ratiocination would have been sufficient for him. But man, by nature, was destined for a nobler purpose. He is set as a spectator in this great theatre of the universe, where he is to attend, not to the outward appearances of things only, and the effects they produce upon his senses, but to discover their nature and essence;—to admire the wonderful art and contrivance by which they are put together, so as to form *one* piece of amazing uniformity and regularity, as well as variety;—to recognise his own and other *minds*,—and, by degrees, to rise to the contemplation of that Supreme Mind, whose infinite goodness, wisdom, and power, have produced the wonderful scene presented to him. For this purpose, it is necessary that he should act from a nobler motive than the mere preservation of the individual, or propagation of the species; and that, not contented with the perceptions of sense, he should form *ideas* of things, by which only any knowledge is to be attained. These ideas, as I have said, are the proper objects of *intellect*, and the materials of all our reasonings and opinions: So that, if the nature of them be well explained, and the way in which they are formed, we shall be able pretty well to understand the nature of this prime faculty of the human *mind*, which I call *intellect*.

In order to explain the operations of *intellect*, by which only its nature can be discovered, it is proper to observe, that, as all our knowledge, in this state of our existence, comes originally from our senses, it is of absolute necessity that the first operation of our minds should be upon the objects of sense: These we compare together, as other animals do; and from these comparisons we draw conclusions, and form what may be called *opinions*, concerning what is useful, or what is hurtful, in the oeconomy of the animal life. This is the only use of the rational faculty which children among us have for several years

years of their life ; and the only use, which whole nations, or rather herds of men, had for many generations before arts and civility were introduced among them : But, as soon as that happened, the latent powers of the human mind exerted themselves, and the *intellect* began to compare the perceptions of sense, in order to investigate the nature of things, and, for that purpose, to form *ideas*.

For explaining their nature, it will be proper to recollect what we have said before, That all sensible or corporeal objects are *matter* and *form* joined together. Of these, the *matter* is not the proper object of *intellect*, but the *form* is ; which is so congenial to *intellect*, that it was said, by some philosophers of old, whom Aristotle commends, to be the place, or region of *forms*, or *specieses* * ; and the proper business of the human mind, in this its state of existence, and the only way in which it can employ its superior faculties, and truly enjoy itself, is, by investigating these *forms*, and evolving them out of the matter in which they are immersed.

This is done, by comparing together the perceptions of sense, not for the purpose of animal life only, for that the brutes do as well as we, and it is there, as I have said, that the *brute* ends, and *man* begins ; but, in order to discover the nature of those external things, which operate upon the senses, and to find out that *form* which constitutes the *substance* or *essence* of every one of them.

For this purpose, the mind makes the review of its sensations ; and the way in which it proceeds is this : As all our knowledge, in this state, is derived from the senses, we observe, that not only different natural substances affect our senses differently, but also the same substance. For example, a rose affects our senses of sight, touch, and smell. Now, that quality which affects any one of our senses, such as the colour, for example, we abstract from the other qualities affecting the other senses,

* Lib. 3. *de Anima*, cap. 5.

senses, or the same sense in a different way ; and we make it a separate object of the contemplation of the mind ; and this abstraction, as I have said elsewhere *, is the first operation of the human intellect, and peculiar to man : For the brute makes no such distinction or separation, and perceives the thing no otherways, than as it is presented to him by his senses, that is, with all its qualities taken together. This quality, thus selected from the rest, we find likewise in other substances ; and then we begin to *generalize*, which is the next operation of the intellect after *abstraction* ; and thus we form the general notion or *idea* of this quality. In this manner, having formed the idea of several qualities, and finding these several qualities united in one substance, we, from that union, characterize that substance ; and, finding the same qualities united in other substances, we again *generalize*, and form an *idea* of this substance † ; which idea is no other than the *form* of the substance, as we conceive it. But it is not, as I have elsewhere observed, the real *essential form* of the thing, but only a collection of such sensible qualities of the thing, as we think of the greatest importance.

From the account I have given of this process of the *mind*, it is evident, that not only the comparative faculty is necessary, but also the *phantasia*, without which we could not *generalize*, unless we were to carry the objects always about with us, and set the one beside the other. And here again we see, that the intellectual faculty is intimately connected with the animal faculties ; and that it is no more, as I have said, than a superstructure upon the animal foundation.

Here we have found that object of the intellect which I before mentioned, and which is no other than the *idea*, or *form*, of any thing, collected, as we have seen, from many individuals. It is certainly not an object of sense, which perceives only the *individual*, but not the *general* : Neither is it an object of the *phantasia*, in which, like-
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* Origin and Progress of Language, vol. 1. page 60. edit. 2.

† Ibidem, page 67.

difference betwixt these two, it is proper to observe, that all things existing are either of *necessary* existence, and are always invariably the same, without change or alteration ; or they are *contingents*, which are continually changing. Of this kind are all things that are generated, and, by consequence, corrupted ; so that they are in a constant flux and vicissitude of corruption and generation. This is the nature of all individual things in this sublunary world : Whereas we conceive celestial things, immaterial substances, ideas, and the truths resulting from them, to be eternal and immutable. Of this last kind are the subjects of science. And, if we reason of these subjects properly, and in such a manner as to deduce things from their causes, then is it *science*. But, if our conclusion is drawn from premises which do not infer it, or, if we believe it to be true, without perceiving the cause why it is so, then it is no more than *opinion*, though it may be true ; for opinion is either true or false ; whereas, in *science*, there is no error.

The reasoning, therefore, upon subjects of this kind, may conclude either in *science* or *opinion* : But, if the *reasoning* be upon subjects of the other kind, *viz.* subjects mutable and perishable, such as all individual things are, then the conclusion can be nothing more than *opinion*, which may be true or false as it happens, but can never be demonstrative, nor any thing more than probable *.

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* This is the account given of the difference betwixt *δοξα* and *πιστημη* by Simplicius, in his commentary upon the 4th chap. of Aristotle, lib. 3. *De Anima*, pag. 58. of the commentary, where he defines *δοξαν* to be *την περι τα ενδεχομενα και αλλως εχειν υποληψιν. και περι τα αναγκαια ανευ της αιτιας πισιν. πιστημην δε την αιτιας και των αιτιων αυτων εχοντων λογικην ανελixin. νοου δε την αδραν και ανεριστον των ορων θεωριαν* ; where it may be observed, that he makes the *νοου* to be only the perception of simple terms : But, as I know no other faculty of the mind by which we perceive the connection of the terms combined, either axioms, or propositions of any kind, I have extended the use of the word to the perception likewise of complex terms.

The last operation of the human intellect that I shall observe, is that by which, abstracting itself from all outward things, it turns, as it were, upon itself, and makes itself its own object; or, as it may be expressed in one word, *reflects*. This is the great operation of intellect, by which, more than by any thing else, we are distinguished from the brute, and of which, therefore, I shall have occasion in the sequel to say a great deal more.

C H A P. VII.

Philosophy of the Human Mind founded upon the preceding History of it—Single and complex Apprehension—Combination of Propositions, or Syllogism—Distinction betwixt the Operations of the Mind upon Subjects without the Mind and within it—Distinction betwixt the Gnostic and Oredic Faculties of the Mind—This Distinction not properly stated by the Commentators upon Aristotle—Only two Gnostic Faculties, Sense and Intellect—Different meanings of the word Sense—The Mind Active as well as Passive in Perceptions of Sense—The Perceptions of the Objects of Sense, by the means of the Phantasia—Of Intellect—It perceives Ideas either single, or in combination—Of Reasoning—Science and Opinion—Explication of all the different Words used upon the Subject of Mind—Of the Operation of Intellect in Abstraction.

IN the preceding chapter, I have only delivered a plain history of the operations of the human mind, which I propose to make the ground-work of the philosophy of it, which is to be the subject of this chapter.

And I begin with the distinction with which Aristotle begins his logical works, *viz.* the distinction betwixt *single apprehensions* and *complex**; a distinction, which is evident from the account above given of the operations of the human mind. By *single apprehension*, I mean the apprehension of a single thing; by *complex apprehension*, I mean the apprehension of things in combination; that is, when they
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* Τῶν λεγόμενων, τὰ μὲν κατὰ συμπλοκὴν λέγεται, τὰ δὲ ἀντὶ συμπλοκῆς. τὰ μὲν οὖν κατὰ συμπλοκὴν οἷον ἀνδρὸς τρεῖς, ἀνδρὸς ἑκά. τὰ δὲ ἀντὶ συμπλοκῆς οἷον ἀνδρὸς, βους, τρεῖς, κακ. Categoriae, cap. 2.

are joined together in propositions, and the one predicated, that is, affirmed or denied, of the other. Of the first kind are all the perceptions of sense; and it is in this way also that the mind perceives ideas; for, though ideas, as we have seen, are collected from *the many*, yet is every idea but one single thing, and must be apprehended at once by the mind, by one single individual act, or not at all, in the same way as the objects of sense are apprehended by the sense. The other kind of apprehension, is that by which the mind, perceiving two things at once, perceives also their connections. The operation of this faculty of the mind is expressed in Greek by the word *ὑποληψις*, which denotes the *apprehension* the mind has of the truth of any proposition. By the same faculty is performed that more complex operation of the mind, by which it perceives not only connection of *ideas*, but of *propositions*, that is, combinations of ideas. And this last operation of the mind is, what is called *syllogism* or *collection*, by which propositions are collected by the *mind* in such a way, that, by their means, it perceives the truth of a proposition different from any of them *.

Another distinction, of great importance in this matter, is betwixt the operations of *mind*, when it is employed upon subjects that have existence without it, and, when it is employed upon things that have no existence but within itself. Of the first kind of subjects are all the objects of sense, whether immediately brought into the *mind* by the perceptions of *sense*, or preserved in it by the means of the *phantasia*. Of the other kind are, first, our *ideas*, which have certainly

* This is Aristotle's definition of a syllogism: συλλογισμός ἐστι λόγος ἐν ᾧ τίθενται τινὲς ἕτερον τι τῶν κειμένων ἐξ ἀναγκῆς συμβαίνει τῷ ταῦτα εἶναι. And he adds, by way of explanation, λέγω δὲ τῷ ταῦτα εἶναι, τὸ διὰ ταῦτα συμβαίνειν. τὸ δὲ διὰ ταῦτα συμβαίνειν, τὸ μὲντοις ἐξ ἑκείνου ἔχει προοδὸν πρὸς τὸ γίνεσθαι τὸ ἀναγκαιόν; where we may observe, that Aristotle makes syllogism a species of the λόγος; by which word, as I have elsewhere observed, the Greeks denoted *comparison* of every kind. And, accordingly, it is evident, that syllogism, and every operation of intellect, is founded, as I have said, upon our faculty of comparison.

ly no existence in the visible world (for all things there are individuals) and, according to the philosophy of Aristotle, have no existence at all, except in *mind*. And, secondly, our *own minds*; and, from our *own minds*, by analogy and comparison, we form ideas of other *minds*, which are objects without us, but of a different kind from the objects before mentioned, *viz.* objects of *sense*.

I come now to a division of the powers of the human mind, made by Aristotle's commentators of the Alexandrian school, particularly by Philoponus, in his introduction to his commentary upon Aristotle's books, *De Anima*. It is, I think, of great importance, and will lead us, if rightly understood, more than any other, into a full and comprehensive knowledge of the human mind. The division I mean, is into *Gnostic* and *Orectic*. By the first we know and perceive; and, by the second, we desire or incline; under which I include also aversion; for aversion is the desire of the absence of any thing. Under the first of these, Philoponus reckons five powers of the mind, *viz.* sense, phantasia, opinion, *Διανοια*, or *discourse of reason*, as it may be translated, and *Νους*, or *intellect*. Now, this division is, I think, in one respect, defective, and, in another, it is much too full; for, if it be considered as an enumeration of all the powers and faculties of the *mind*, there are two wanting, namely, *memory*, which, as I have said, is the repository of ideas; and, *secondly*, *ἐπιστήμη*, or *science*, by which the mind makes scientific or demonstrative conclusions of reason. Again, if it be considered as a division only of the *gnostic* powers of the mind, and as such only Philoponus has given it us, it is much too full; for the *gnostic* powers, or powers of perception, are only two;—that by which we perceive the objects of sense, whether present, through the operation of them upon our organs, or absent, by the means of the *phantasia*; and with this faculty of perceiving those objects, I join the faculty of comparing them, in the manner above mentioned;—and that by which we apprehend ideas, either single or in combination, in the manner

manner that I have explained above. The first of these is common to us with the brutes, the second is peculiar to us.

This distinction is as real as the distinction betwixt *general* and *particular*, or betwixt the idea and the individual object ; or, in other words, betwixt what really exists, and what has only an existence in the mind. And, that it is a full and compleat division, is evident from this, that every thing in nature is either *particular* or *general* ; and there are no objects with which the mind can be conversant, except either objects of sense, or objects of intellect. Faculties, therefore, that are exercised upon objects so different, ought to be considered as different faculties : And, accordingly, we find that the faculty which operates upon particular objects, whether single or compared together, is common to us with the brutes ; whereas, the faculty which operates upon *generals*, whether single, or in combination, is peculiar to man.

The first kind of perception I mentioned, of particular objects when present, is well known by the name of *sense* or *sensation*, as I would chuse to call it ; for the word *sense*, I observe, is used in different significations ; denoting, either the organ of sense, the impression which bodies make upon that organ, the actual perception of the mind arising from that impression, which is what I chuse to distinguish by the name of *sensation* ; and, lastly, the power or faculty which the mind has to perceive in that way. And this is the meaning in which I use the word *sense*. And I think it is of great advantage, in matters of philosophical inquiry, to use terms that are not ambiguous, and to distinguish by *words* things that are, in their *natures*, distinct, as the four things I have just now mentioned certainly are : For, that the organ of sense is different from the impression made upon it, by external objects, no body can doubt ; and, to the philosopher it is as evident that there is a difference betwixt the impression of the object upon the organ, and the perception of the mind ; for it often happens,
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that the impression made upon the organ does not reach to the mind ; so that, '*seeing we see, and do not perceive ;*' which convinces me that there is something more than mere *passivity* in the perception of objects of sense, and that the mind *acts* as well as *suffers* ; though the one follows the other so instantaneously, that it is only the philosopher that can make the distinction : And, in general, it appears to me, that all the *gnostic*, or perceptive powers of the mind, must, of necessity, be active ; for, to *know*, or to *perceive*, is to *act* ; and the only difference that, in this respect, can be betwixt them, is, that some of them must be roused to action, by external impressions made upon the mind, or, in other words, that the mind must *suffer* before it acts ; whereas, others of them *act* without any such *sufferings*. And, *lastly*, the *sensation*, or actual perception of the object, and the faculty of perception, or the *sense*, as I chuse to call it, are as different as *power* and *actuality*, or *δυναμις*, and *ἐνέργεια*, as the Greek philosophers express it.

The other kind of particular objects, which, I said, was perceived in this way, is the images of sensible things preserved in the *phantasia* : And it is to be observed, that there is here, too, a great confusion of language ; for there are here three things to be distinguished ; *first*, The repository, as it may be called, of such images ; *2dly*, The faculty the mind has of perceiving them ; and, *lastly*, The act of perception. Now, for all these three, I know but one word, even in Greek, and that is, *phantasia*. And yet it is evident that, in analyzing the operations of the mind, these three must carefully be distinguished, otherwise we shall never be able sufficiently to distinguish, in this matter, the man from the brute ; for, as to the *phantasia* itself, and the painting of the images there, to use Plato's metaphor, I do not know that there is any great difference betwixt us and the more perfect brute animals. But, as to the faculty of perceiving these images, and the actual perception of them, there is a great difference ; for the brute never perceives any of these images, unless prompted by some bodily appetite,

appetite, or propensity, necessary, either for the preservation of the individual, or of the species; whereas, the human mind can, without any such prompter, and self-moved, conjure up those forms, or phantoms, as they may be called, in the imagination, and join or disjoin them, vary, and put them together, as it thinks proper. In this way, a man makes of his imagination a kind of magic lantern, in which he exhibits to himself pictures of all kinds, beautiful and pleasant, or ugly and frightful. This, in our dreams, makes *wild work*, as Milton says*; but, when we are awake, it produces all the fine arts of imitation and design, which make the delight of human life. But, however fanciful and various those pictures may be, the materials of them are always taken from sense; for the warmest imagination of the poet can create none new. The maxim of the schoolmen, therefore, that *nihil est in intellectu, quod non fuit in sensu*, though it be not true of intellect, is certainly true of the phantasia.

The next thing I observe, concerning the operations of the mind upon particular objects, is the comparing them together, either as they are perceived by the sense, or represented by the imagination. This faculty, as I have observed, is common to us with the better kind of brutes; but there is but one name, even in Greek, both for the *faculty*, and the *act* of comparing, viz. λογος, which, as I have said, the Greek philosophers apply even to brutes†. And, as we have no other word to express λογος but *reason*, I hope it will not give offence, if I should say that these brutes have *reason*, at least, in some degree. But there is no word at all in English to express the conclusion of that comparison or deliberation among the brutes, which is a determination to act in one way or another: Nor do I know that there is any word for it in Greek, at least in common use, (for some philosophers, as I have observed before, give it the name of λογος,) ex-

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* Paradise Lost, Book 5. v. 112.

† See Porphyry, in his work, *De Abstinentia*. See also Aristotle, lib. 2. *De Anima*, cap. 3. in fine.

cept it be *ἔργον*: Neither does that exactly express it; for it only denotes that impulse of the mind, which is consequent upon it, and immediately precedes the act, and is not peculiar to brutes, but is common to man with other animals*.

These are all the operations of the human mind which fall under the first class of its gnostic powers, viz. the faculty of perceiving particular objects, whether singly or in combination; and I come now to speak of that higher gnostic faculty, by which it perceives *generals*, either singly, each by itself, or combined together in propositions. This faculty, in Greek, is called *νοῦς*; and, in English, *intellect*. By this faculty, it is admitted, by all philosophers who have reasoned to any purpose upon the subject of *mind*, that we perceive single ideas; and, in the same manner, that we perceive external objects by the senses; that is, at once, by one single individual act; or, as the Greek philosophers express it, *μία ἐπιστολή*. It is also admitted, by all these philosophers, that it is by the intellect we perceive the truth of self-evident propositions: So that this kind, at least, of complex apprehension, is the operation of this faculty: And, for the same reason, I think, it must be admitted, that the perception of the truth of any proposition, however we attain to that perception, is the act of the intellect, and is as much one single individual act, as the apprehension of a single idea. The only question,

* The distinction that I here make betwixt *λογος*, or *reason*, and *νοῦς*, or *intellect*, one of which, I say, is common to man and brute, the other peculiar to man, will no doubt appear to many readers new and strange; but it is not any discovery of mine, being to be found, as every thing else of any value in this work is, in the writings of the antient philosophers, particularly, in a most valuable piece of Pythagorean philosophy, Hierocles in *Aurea Carmina*, editio Needham, p. 160. where he says, that the *λογος* or *ψυχῆς λογικῆς*, holds the middle place betwixt the irrational, that is, the lowest part, of our nature, and intellect, which is the highest. This is just where I have placed it; for the senses and phantasia are the irrational part of our nature, being altogether incapable of comparison, in which the essence of reason consists. Now, I have set above them the rational faculty, and above it the intellect: As, therefore, the antients distinguished in this manner, it cannot be wondered, that, to the better sorts of brute, they gave that faculty, which is next to the highest faculty in man, though, as we have seen, very different from it, and, by many degrees, less excellent.

tion, then, remaining, is, Whether the *διαλογισμὸς*, the *δοξασμὸς*, and the *ἐπιστήμη* be, as Philoponus supposes, faculties different from the *Νόστος*, or *intellect*. Now, I say, they are all three only different operations of the *intellect*: The *διαλογισμὸς*, as I have already said, is no more than the *discourse* of the intellect, by which it passes from one thing to another, as the etymology of the word in Greek imports *, in order to discover the connection of two ideas, which otherwise it could not discover; or, in other words, it is in order to prove a proposition that is not self-evident. The result of this operation of the intellect is, as I have already observed †, either *δοξασμὸς*, or *ἐπιστήμη*, that is, *opinion*, or *science*, according to the nature of the subject, or the manner in which the inquiry has been conducted.

And thus, I think, I have proved, that there are but two *gnostic powers* in the *human mind*; the one by which *particular things*, that is, objects of *sense*, are perceived; the other by which *generals*, or *ideas*, are perceived, instead of five that Philoponus makes them. And I think I have shown, that the other three are only different manners of operating of the two I have allowed, not different powers. I can, however, very easily excuse the mistake that Philoponus has fallen into, when I consider the promiscuous, and, I may say, inaccurate, use of words by Aristotle himself upon this subject: Particularly, as his commentator Simplicius has observed ‡, he has confounded *Νόστος* and *Πῶς* and

* Philoponus gives another derivation of the word *διαλογισμὸς*, which is certainly not grammatical; nor do I think it is so agreeable to the nature of the thing; for he derives it from *διαλογίζωμαι*, signifying, to *perfect* or *accomplish*; whereas the *διαλογισμὸς* is only a research or investigation, where the mind passes from one thing to another; and it is only the conclusion of it, that is, *ἐπιστήμη*, or *δοξασμὸς*, which can be called *perfection*, or *accomplishment*. His derivation of *phantasia*, above given, is more agreeable to the nature of the thing, but as ungrammatical; for the true derivation is given us by Aristotle himself, who says it is from *φαντασία*, or its derivative, *φαντασίζω*; by which, he says, this way of perceiving things is compared to the clearest and most evident of our senses, viz. *seeing*. Lib. 2. *De Anima*, cap. 4. *in fine*.

† Pages 105. 106.

‡ In his Commentary upon the third book, *De Anima*, page 62.

and *διανοία*, and *νοεῖν* and *διανοεῖσθαι*; but, from what I have said, I hope the meaning of all the terms upon this subject is sufficiently distinguished, such as *κίνησις*, *φαινομένη*, *Νοῦς*, *ὑποληψις*, *διανοία*, *δέξαι*, and *ἐπιστήμη*. As to the terms just now mentioned, *νοεῖν* and *διανοεῖσθαι*, there can be no difficulty in understanding them, if we know what *Νοῦς* and *διανοία* are: As little in understanding what *νοεῖν*, *νοήσις*, *διανοητά*, *δέξασθαι*, and *ἐπιστήμη*; for all these words, by the analogy of the Greek language, have a determined signification in reference to the verb from which they are derived; the first, for example, signifying the action of the verb, the rest denoting the subjects of that action: And it is only to be observed with respect to *νοήσις*, or the subjects of intellect, that they are of two kinds, the one, material things, as they exist in nature; but which, by the operation of the mind, that we call *abstraction*, (*αφαίρεσις*, in the language of Aristotle), are made objects of the intellect. Of this kind are all mathematical entities, and indeed almost all the subjects of science. The other kind of *νοήσις* are immaterial substances, which exist separately from all matter, and therefore have no need to be abstracted from it by so artificial an operation of our mind: For it may be observed, that though these *abstracted beings* are not, as I have already observed *, what the schoolmen call *entia rationis*, yet they have not the same real existence that either corporeal or incorporeal substances have.

The abstraction by which we form those notions, is another operation of the *human intellect*, which deserves our particular attention; for it is, as I have shown, the foundation of all the other operations; because it is by it that intellect creates, as it were, subjects for itself, and the first subjects upon which it operates; for the other kind of *νοήσις*, that is, immaterial substances, come not to be the objects of *intellect*, till it has been for a long time exercised upon the *ideas* of *abstraction*: And, though *uniting* be no doubt, as Aristotle has observed, the great work of *intellect* †, yet it is evident, from what I have

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* Page 53.

† Orig. and Prog. of Lang. vol. 1. book 1. cap. 6. p. 61. edit. 2.

said above, that *separation* is the first act of *intellect*, without which it could not have objects upon which to operate.

There is an observation of Simplicius * upon the subject of abstraction, which I think well worth taking notice of, as it shows, more than any thing, that it is the operation of the highest faculty of our *mind*. He says, that those ideas of the qualities of *bodies*, which we abstract from the *bodies*, are corrected and improved by the *intellect*, and made more perfect than they exist in the *bodies*. Thus, there is not in nature a perfect circle, or a perfect sphere, nor any other mathematical figure, so perfect as it is conceived by the *mind*. The same, I think, may be said of moral qualities: For there is not existing, neither a perfect good man, such as we can conceive, nor, I believe, a perfect villain †.

Thus, I have shown, that there are in the human *mind* but two *gnostic powers*, viz. *sense* and *intellect*;—that the brutes have *sense* as well as we;—and that they preserve in their *phantasia* the *perceptions* of *sense*, as well as we do:—Further, that they compare together the *perceptions* of *sense*, and therefore, may be said, in some degree, to reason:—That, as the objects of *intellect* are quite different from the objects of *sense*, so the faculty itself is altogether different, and is the great

* In his commentary upon the 3d book *de Anima*, fol. 65.

† Here we may see the origin of that ideal beauty, of which painters and statuaries speak so much, and which, they acknowledge, is the perfection of their art: For, it is no other than ideas of beauty, taken from *forms* actually existing, but corrected and improved by the *intellect*; so that they become something *transcendant*, and beyond nature, though not unnatural, because they are nature made more perfect. And the same, I think, may be said of all the works of art, in which there is nothing perfect, but what is more beautiful than any thing to be seen in nature: For, though the individual objects may be exactly copied from nature, yet, there must be an arrangement and disposition given to them, such as is not to be found in nature, otherwise the piece will not be fine, and, indeed, will not deserve the name of a piece of art, from which it will be as different as a portrait is from a picture.

great prerogative of the human *mind*, denied to the brute:—That the *first* operation of this faculty is *abstraction*, by which it forms its proper object, viz *ideas*;—the *second* is that by which it apprehends those ideas, whether single, or joined together in propositions;—and the *third* and *last*, is the *discursus mentis*, or *dialectica*, as it is called in Greek, by which it investigates and discovers the connection of ideas, that it could not at once discover; and the conclusion of this last operation is, as I have shown, either *science* or *opinion*.

CHAP.

C H A P. VIII.

Continuation of the Subject of Intellect—Intellect divided into Speculative and Practical—Difference betwixt these two—The Virtue of Prudence belongs to the Practical Intellect—Manner of reasoning of the Practical Intellect—Good, real or apparent, the Motive of all Rational Actions—Difference betwixt Weak and Wicked Actions—The Nature of the Speculative Intellect—The End of it Truth—Speculative Intellect operates without the Assistance of the Senses or Phantasia—Passage of Aristotle upon that Subject explained.

AS intellect is undoubtedly the governing principle in us, and may be said to constitute *man*, I think it is proper to inquire still further concerning it, before I proceed to speak of the *præctical* part of *mind*. And, there is a distinction made by Aristotle betwixt *intellect* employed in contemplation merely, that is, the *νοῦς θεωρητικὸς*, and *intellect* employed in practice, or the *νοῦς πρακτικὸς*, that deserves well to be attended to. The object of the contemplative *intellect* is truth only, and the discovery of the nature of things; whereas, the object of practical *intellect* is the practice of *life*, and the conduct of human affairs, though the *intellect* may be, as we have seen, and indeed must be, in a certain degree, employed in all the arts, the mechanical as well as the liberal.

And here we must not fall into the same mistake that we see Philoponus has fallen into, in treating of the *gnostic* faculties of the *mind*, nor make, as he has done, the operations of the same faculty distinct faculties: For, both the theoretical and practical *intellect* are the same faculty of the *mind*, but employed upon different subjects, and
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for different purposes; the subject of the one being altogether *generals* and theorems of mere speculation; whereas, the subject of the other is both general truths and particular things; for, it is in *particulars*, and not in *generals*, that practice consists.

It may be objected, that *generals* or *ideas* are the only objects of the *intellect*, and that particular things are the perceptions of the *sense* alone; and that, therefore, these things cannot be considered by the *intellect*. But this consequence does not follow: For, though the *intellect* does not perceive things corporeal, yet, when these perceptions are brought into the *mind* by the *senses*, the *intellect* can review and consider them. And, it is by such a review, as we have said above, that the *intellect* forms to itself its proper object, *ideas*, comparing together the perceptions of *sense*, and discovering in what they agree, and in what they are different: For, it is the privilege of this superior faculty of the *mind*, to make use of the materials imported by the other *gnostic* faculty, viz. the *sense*, not only for the purpose of creating new materials for itself, but for any other purpose it thinks proper. In this case, it applies its theorems and general propositions to particular things, in order to regulate the conduct of *life*, or, in any other respect, to direct the actions of *men*.

From this account of practical *intellect*, it is easy to perceive, that the virtue we call *prudence* belongs to it. This virtue is most justly set at the head of all the virtues, as being that, without which, there can be no other virtue; for every action, though it proceed from the best natural disposition, if it be not the result of previous deliberation, and determined choice, is not a virtuous action, nor, indeed, properly speaking, a *human* action, but the action of the mere animal; some of whom, we see, perform actions which may be called *good*, as they produce a great deal of *good*; such, for example, as the care of the offspring, being absolutely necessary for the preservation of the species;

species; yet, as they do not proceed from any general theorem or proposition, applied to particular facts, they are not virtues.

The operation of the *intellect* in this practical reasoning, is called in Greek βούλευσις *, that is, *deliberation* or *consideration*; and the determination of the *mind*, preferring one action to another, is called προαιρεσις, that is, *choice*, in consequence of deliberation.

Aristotle has observed †, that, in the reasonings of this kind, the *minor* of the syllogism is always a particular proposition: And this, as he observes, does more immediately and directly prompt us to action, than the general proposition in the *major*; for general propositions of themselves do not move to action, but must be first applied to particulars.

It will be asked, what is this general proposition, which ultimately, if not immediately, moves man to every action proceeding from deliberation or choice? This is to ask, in other words, what it is we aim at, or propose by such actions? And the answer is, it is *good*, either real or apparent. If it be really *good*, then is the action truly wise and virtuous; but, if it be only seemingly *good*, and not really so, then is the action weak or vicious. On the other hand, the motive of the brute is the τὸ ἥδον, or what is pleasant, or agreeable to the sense. And, as many men, and, I believe, all men upon some occasions, act from this motive merely, without choice or deliberation, in so far they act like brutes; but, whenever they chuse and deliberate, they do the thing, because they hold it to be *good*: If they think so, overcome by the present pleasure,

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and

* See what Aristotle has said concerning βούλευσις, and the τὸν βουλευτικόν, and also concerning προαιρεσις, in his 3d and 6th books of *Morals*.

† Book 3d *de Anima*, cap. 11. *in fine*.

and contrary to what would be their judgment if the temptation were removed, then they are only weak, or intemperate: But if, upon cool deliberation, the determination of their judgment is, that it is best for them to act so, then are they truly vicious and wicked, not weak: Yet do they act as rational creatures; but, for that very reason, are so much the worse, because the corruption of the leading principle of the animal makes him the worst of his kind: And if, to this corruption, courage and resolution, with great abilities, are joined, he is the most mischievous and most dangerous animal in this lower world*.

From what is here said, the syllogism mentioned by Aristotle may easily be formed. It proceeds in this way:

What is good ought to be done.

This particular action is good.

Therefore, this particular action ought to be done.

Here the *major* proposition is general, the *minor* particular; and the conclusion, as must necessarily be, according to the rules of syllogism, likewise particular. And thus much for the *practical intellect*.

As to the *speculative*, it is wholly conversant with the proper object of intellect, *ideas*, and *theorems*; for, though it may sometimes descend to particular facts and observations, it is only with a view to *theorems* and *speculations* which it may from thence raise. Nor has it any thing to do with *practice*, or *action* of any kind. And, as the *final cause*, or *end* proposed by the other *intellect*, is what is *good*, so the end of this is *truth*.

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* See what Aristotle has said upon this subject in the 7th book of his morals, where he has very accurately distinguished betwixt *ακρασία* and *ακολασία* or *κακία*, and *σφραγισμένη* and *εγκρατεία*, with many other distinctions, which are not the less solid for their not being obvious.

The ideas with which inferior sciences are conversant, are those which are abstracted from material things. But the chief subject, as I have often said, of the science of which I treat, is *mind*, and *immaterial substances*.

From this account of the *speculative intellect*, it is evident, that, in the greater part by far of its operations, it has no need at all of the *senses* or *phantasia*, which, as we have seen, are absolutely necessary in the operations of the *practical intellect*: And, as to the last mentioned subject of this *intellect*, it is impossible to have a just notion of it under a bodily form; because it is as incapable of being painted in the *phantasia*, as apprehended by the *sense*. And, even with respect to *ideas*, abstracted from *material substances*, they are much better conceived, without any assistance from *sense* or *imagination*: For, as Plato has observed in the *Phaedo*, the *phantasia* disturbs us very much by intruding its images into the speculations of *science*, and particularly, the *science* of *divine things*, the *ideas* of which are altogether confounded by ascribing to them any of the qualities of *body* *. Aristotle has indeed said, that we cannot think without the assistance of the *phantasia* †; but it appears from that and other passages, that this is to be understood only of the *practical intellect* ‡: And it is clearly the opinion of both his commentators, that *pure intellect*, when disengaged from all *material things*,

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things,

* See what Philoponus has said upon this passage of Plato, in the beginning of his introduction to his commentary upon Aristotle's books *De Anima*.

† *De Anima*, lib. 3. cap. 7.

‡ The passage is in these words: Τῇ δὲ θεωρητικῇ ψυχῇ τὰ φαντασμάτα οὐκ ἀπαιτούνται ὑπαρχόντων. ὅταν δὲ ἀγαθὸν ἢ κακὸν φησὶ, ἢ ἀποφθόνῃ, φθύνῃ, ἢ διακρίνῃ διὰ ἐνδοπίαν, τότε αὖτις φαντασμάτος ἡ ψυχή. Where it is evident, that, though Aristotle has mentioned the *ψυχή θεωρητική* in general, he means the *θεωρία πρακτική*. This appears from the whole context, and from this very part of it where he mentions the *ἀγαθόν*, and the *κακόν*, and the *το διακρίναι*, and the *το φαντασά*, which are the objects of the *practical intellect*. But, that Aris-

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things, does operate without the *phantasia*. It must, however, be confessed, that we are so much immersed in matter from our first coming into this world, so much intangled with it, by the necessity of our mixed nature, that it is very difficult to think with perfect abstraction: But, by much practice in *speculative sciences*, we come at last to be able to do it. Of this, I think, we need no other proof than the *science* of *arithmetic*, with the ideas of which, though the most abstract of any, we become so familiar, by constant use from our earliest youth, that

Aristotle believed that the *νοῦς θεωρητικὸς* could operate by itself, without any mixture of sense or *phantasia*, is evident from what he says in chap. 6. of the same book, That this *Νοῦς* is, by its nature, separated from body, unmixed, impassive, and pure energy. And that this is the opinion of his commentator Simplicius, is evident from his commentary upon the passage first quoted. And Philoponus, in his commentary upon the last mentioned passage, enumerates the operations of intellect without the *φαντασία*, as when it makes itself its object, when it contemplates *divine*, or *immaterial substances*, also when it contemplates generals, or whatever else can be apprehended without the senses. And he says this is also the opinion of Aristotle. And, for further proof that he is in the right as to Aristotle's opinion, I refer the reader to the 9th chapter of the same 3d book *De Anima*; in the end of which he has these words, *τα δὲ πρῶτα νοήματα τινὲς διοίσει τοῦ μὴ φαντασμάτων εἶναι; ἢ οὐδὲ ταῦτα* (so Philoponus reads it in place of *τ' ἄλλα*, as it is commonly printed) *φαντασμάτων, ἀλλ' οὐκ ἀπὸ φαντασμάτων*. Here Aristotle is speaking of the common *νοήματα*, or notions of corporeal things, which are undoubtedly phantasms, that is, the objects of the *phantasia*; whereas, the *πρῶτα νοήματα* that he here mentions, are, as Simplicius has well observed upon the passage, our ideas of substances, and particularly of incorporeal substances: And he states the doubt, whether they be not also phantasms? and he solves it in his common way, by asking a question; the answer of which is plain to those who are acquainted with Aristotle's manner, that they are not phantasms, though they could not have existed without phantasms; that is, the ideas could not have been formed without assistance from the *phantasia*; which is certainly true of them as well as of every other idea. And, if there were any doubts of our apprehension of simple ideas without the assistance of the *phantasia*, I think there can be none concerning our apprehension of them when combined in propositions, especially those propositions that are called *axioms*, such as this, '*that every thing must either be or not be.*' See what Philoponus has said concerning these axioms in his introduction to his commentary upon the books *De Anima*.

that I believe no body, in solving an arithmetical problem, makes any use of the *imagination* at all, or thinks of any *corporeal thing*. And Plotinus, and some of the later Platonists, pretended, that, by thinking often upon divine subjects, they came at last to have the same clear and distinct notions of them, without the least mixture of any thing gross or material, and to be in some sort united with them in a manner incomprehensible to vulgar minds*. And so much for the *gnostic powers* of the *human mind*.

* See what Philoponus has said upon this subject in the beginning of the introduction to his commentary upon Aristotle's books *De Anima*. See also the author of the life of Plotinus, affixed to his works.

CHAP.

C H A P. IX.

Of the Orectic Powers of the Mind—These not fitly divided, either by Philoponus or Plato—Different Orectic Powers belonging to the Animal and the Intellectual Nature—Those of the Animal Nature—Those of the Intellectual—What is the Cause of Animal, that is, Voluntary Motion—Aristotle's Opinion upon the Subject—Mind, the Cause of all Motion, according to the Definition of it.

MAN, as well as every other animal, being by nature destined to act, it was necessary not only that he should *know*, but that he should have some principle of *action*. The *orectic* powers, therefore, as well as the *gnostic*, are essential parts of the animal composition; but the *gnostic* have, by nature, the precedence; for, unless we suppose animals to act by mere chance, without any direction at all, they must necessarily *know* before they *act*.

Gnostic and *orectic* powers being thus necessarily joined together in the animal nature, and corresponding the one to the other, it is natural to suppose, that, as man has more *gnostic* powers than other animals, he should also have desires and propensities more than they have; nevertheless, Philoponus, or whoever besides (for it is not Aristotle) has made the division of the faculties of the mind into *gnostic* and *orectic*, has omitted altogether the *orectic* part of the *intellectual mind*, and has given us only that of the mere *animal* or *sensitive mind*, which he has subdivided into *ἐπιθυμία* and *θυμός*, or *appetite* and *anger*. And Plato, who has divided the human mind into *ἐπιθυμία*, *θυμός*, and *λογος*, has, besides omitting the *orectic* powers of the *intellectual mind*, plainly confounded the *gnostic* and *orectic* faculties: For, whether we understand by *λογος* the mere comparative facul-

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ty, which the brutes possess as well as we, or the *Nous*, that is peculiar to man, it is evident, that *λογος*, belongs to the *gnostic faculties* of the human mind.

The *orectic powers* of the brute are, as I have observed, fitly divided into what I call *appetite* and *anger*; for, as the brute has nothing to do here but to nourish and support the individual, and to propagate and educate the species, and likewise to defend himself and his offspring against danger, and to overcome difficulties, these impulses are sufficient for both those purposes. By the first, he is directed to provide nourishment, and every other thing necessary both for his *being* and *well-being*: And he is likewise impelled to propagate the species, and to take that care of the offspring which is necessary for raising it; for that *στοργη*, or natural affection, which is so strong in the brutes, I comprehend under *επιθυμια*, or *appetite*, as I translate it: And, by the other, he is enabled to defend himself against dangers, to overcome difficulties, and, in short, to exert that strength of mind, which is necessary, in some degree at least, for the preservation of every animal and his offspring.

These are the *orectic powers* of the brute, corresponding to the *gnostic powers*; and they are the same in man, so far as he participates of the same animal nature, and has the same *gnostic powers*. But he has, besides, the superior *gnostic faculty* of *intellect*; and there must needs be some desires and propensities corresponding to this faculty; and, as this faculty is divided into *practical* and *speculative*, it is natural to suppose that there should be the same number of *orectic powers*, each corresponding to each of the other two. What corresponds to the *speculative intellect*, is the *love of knowledge*: For, as truth, and the knowledge of the nature of things, is the object of this part of the mind, and, as it is impossible to suppose, that *intellect* can act without some motive, what moves men to search for truth, must be the love of knowledge: And, accordingly, Aristotle has observed, that,

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not only the philosophers desire knowledge, but even the vulgar, though they enjoy but little of the pleasure of it*. Nor is that to be wondered at; for it is the pleasure of intellect, of which the vulgar have but a small share.

The *orectic* power corresponding to the *practical intellect*, is the desire of *good*; under which I include the *fair* and the *handsome*, or the *το καλον*, as the Greeks call it, which, by some philosophers, was held to be the only *good*†: For *good*, being, as I have already observed, the object of this part of the human mind, it must necessarily be desired by it: Whereas, as I have likewise observed, the object of the pursuit of the brute is the *το ηδον*, or the *pleasant*; and that is sufficient for all the purposes of his nature, as shall be afterwards shown.

In treating of the *practical intellect*, Aristotle takes occasion to inquire what it is that produces the progressive motion in animals? an inquiry which, I think, might have been made more general, and extended to the motion, even of such animals who do not change their place altogether, but only in part. Upon this question, he bestows two chapters, viz. the 10th and 11th of his third book *De Anima*; in the first of which, he doubts, according to his manner, and, in the second, decides. The result of the whole is, that there are three things which produce the animal motion; *first*, the *νοον*, or *intellect*, under which

* μάθαιεν· ου μόνον τοις φιλοσοφοις ἔδιστοι, ἀλλὰ καὶ τοις ἄλλοις ἡμοίαι· ἀλλ' ἐπὶ βραχυ ποιησονται αὐτοῦ. Lib. *De Poetica*, cap. 4. See also *Metaphys.* lib. i. cap. i.

† The philosophers I mean are the Stoics. Aristotle wrote a book *περὶ τοῦ ἀγαθοῦ καὶ τοῦ καλοῦ*, which he somewhere quotes. This book is unfortunately lost, as well as many works of his: But he has, in his books of *Rhetoric*, lib. i. cap. 9. *in initio*, given us two definitions of the *το καλον*. The one is ὅτι δι' αὐτοῦ ἀρετὴν ἐν, ἐπαίνεται η. And the other is ὅτι καὶ ἀγαθὸν ἐστὶν, ἡδὺ η, ὅτι ἀγαθόν. This last definition I like best; for I hold the *fair*, or the *handsome*, to be that which, being *good*, that is, serving some useful purpose of nature, is, at the same time, *pleasant* to us, because it is *good*; for, if any thing be desired, merely because it is *pleasant*, and not because it is *good*, it is the *το ηδον*, and not the *το καλον*.

which he includes the *phantasia*, being an internal principle, as I before observed, as well as the *intellect*, and the governing principle in brutes, and also in some men. Secondly, the *ορεξις*, that is, *desire*, or *appetite*. And, *lastly*, the *το ορεκτον*, that is, *the object desired*. And it is certainly true, that animal motion cannot be produced without all the three. But I think it is worth the while to consider more particularly, in what manner each of them contributes to the production of motion; and I will begin with the *last*, that is, the *object desired*; the final cause of the motion, which, therefore, is the first or principal cause, being that for the sake of which every other cause operates. Now this, in man, considered as an intellectual being, is either *good* or *knowledge*; the one being the object of the practical, the other of the speculative intellect. But, of man, considered as an animal merely, the object is, *what is pleasant*. The object, whichever of the three it be, is itself immoveable, as Aristotle has observed: But it moves the *desire* or *appetite*; and that again moves the animal. And it is in this way, that the desire, as the efficient cause, produces the movement. But it is through the medium of the mind that it does so; for the desire first excites the mind to act, and then the mind produces the movement; so that the mind is the immediate efficient cause of the movement, and the *desire* only the remoter. But the desire cannot arise, unless the object be known; and thus we see that the *gnostic* powers of the mind are its fundamental powers, without which we cannot suppose it either to act, or to desire to act; for the common saying will apply, that '*ignoti nulla cupido*.' The mind, therefore, must *know* before it *acts*; and, whatever is the governing *gnostic* principle in it, whether *intellect*, *phantasia*, or *sense*, must be the prime efficient cause of all the movements of the body, that can be called animal, voluntary, or spontaneous of which the principal is progressive motion: For, as to the motions, by which growth and nutrition are produced, they are involuntary, and belong not to the animal, but to the vegetable life.

R

And

And, here, after going a great round, and departing very far, as it should seem, from the original definition we have given of *mind*, viz. That it is *what moves*, we are come back to it again; and we find that it applies to every kind of mind, even the intellectual: For the intellect, when it descends from abstract speculations to the practice of life, does necessarily, as the governing principle of the mind, produce the motions of the body; and, even when it is overcome, and governed by *passion* and *appetite*, instead of governing *them*, yet it is still what moves the man, if the action be the consequence of any reasoning or deliberation at all. It is, therefore, I think, true, notwithstanding what Aristotle has said to the contrary *, that there is something in common belonging to all minds; and some other definition may be given of *mind* in general, than that it is the perfection of an organized body.

C H A P.

* Vide supra, p. 75.

C H A P. X.

The Human and Brute Minds specifically different—If they be of different Specieses, there must be fixed Boundaries betwixt them—Comparison of the two—No Comparison betwixt us and the lowest Kind of Animals—The Comparison only betwixt us and the higher Sort—Different Specieses of Animals must have different Minds—Comparison of our Senses with those of other Animals—Two Differences betwixt our Phantasia and that of the Brute—Difference betwixt our Comparative Faculty and that of the Brute—One Class of the Objects of Human Perception quite different from those perceived by the Brute—Therefore the Faculty different—Man recognizes himself—The Brute not—Comparison of the Orectic Powers of the Man and Brute—Those of the Brute, being directed by Nature, do no hurt.—Those of the Man, being guided by Opinion, do a great deal—Summary of the Account of the Human Mind, and of that of the Brute—The Error of our Modern Philosophers in confounding Ideas and Perceptions of Sense—Objection that, though other Animals have not the Use of Intellect, they may have the Faculty—That Objection answered.

ALTHOUGH, from the preceeding chapters, it be evident that, I think, the human mind is very different from the brute, and of a nature much superior ; and, although it be not difficult to collect, from what is said there, the arguments that move me to think so ; yet, as it is a matter of such consequence, I have thought it not improper to state, in this chapter, those arguments by themselves, unmixed with any thing else. For the human mind is so intimately

connected and interwoven with the animal, that it is a matter of nice discrimination to separate them. I know that, in such cases, superficial inquirers satisfy themselves, by observing, that, in nature, things are blended together, and run into one another insensibly, like different shades of the same colour; so that it is impossible to say where the one begins, or the other ends. But I hold that, in nature, the specieses of things are absolutely distinct; and if, at any time, they are mixed, the production is unnatural, and does not go farther than the individual monster; (for so I call every production out of the common course of nature;) and, if it were otherwise, there would be no beauty, order, or regularity, in nature; but every thing would be mixed with every thing, according to the notion of Anaxagoras: And, however fair the outward appearance of this world may be, so as to deserve the name given it in Greek, *κοσμος*, yet it would, in reality, be no better than the original chaos of the poets. I hold, therefore, that, if the human mind be truly of a kind different from the brute, there are certain fixed limits and boundaries which separate them, however difficult it may be for us to find them out.

In order to make this discovery, the readiest way will, I think, be to state the comparison betwixt the two *minds*; and to observe, *first*, in what they agree; and this will make the things, in which they differ, more observable.

In the first place, I think it is impossible to maintain, that the minds of *worms*, *flies*, or of those animals of so low a kind, as to be something betwixt animal and vegetable, and which, therefore, are called *Zoöphites*, are of the same kind with our minds, even in *power* or *capacity*: For, as nature does nothing in vain, according to that excellent maxim of Aristotle *, it is impossible to suppose, that she would

* Aristotle *De Anima*, lib. 3. cap. 10. His words are, *μητι μὲν ἢ φύσις ποιεῖ μάτην, μητι κωλύει τὴν ἀναγκαίαν*, That nature does nothing superfluous or unnecessary: nor

be so prodigal and superfluous, as to give them a capacity which they never could exert. And, if their minds be not such as ours in *capacity*, as they are certainly not such in *energy* or *actuality*, I think we may fairly conclude, that they are of a different species: For I do not see how we are to discriminate specieses, if it be neither by *power* nor by *energy*. The only question, therefore, is, betwixt us and animals of a higher order, such as dogs, horses, elephants, beavers, &c.; and it is only with such animals that I am to make the comparison of our species.

That we are a species of animals different from any of those just now mentioned, no body, I believe, will deny. Nor, do I think, it can be denied, that the specieses of animals are more distinguished by their *mind*, or inward principle, than by their outward figure; for, as it is the *mind* that is the moving power, and which therefore is principal in every animal, and, as the *body* is no more than the organ or instrument that the *mind* uses for accomplishing the purposes, for which, by nature, the animal was destined, it follows, of necessary consequence, that, if there be a distinction of specieses, it must be in the *mind* chiefly, and only by consequence in the *body*: So that there must be a species of *mind* for every species of animals; and, however near two specieses may seem to come to one another, still there must be some discriminating mark, which distinguishes the *mind* of the one from that of the other. And this argument alone, however metaphysical it may seem, (for that is the common name given by the vulgar to arguments that they do not understand), is, in my opinion, sufficient to decide, that there must be a difference *specific*, and not in *degree* only, betwixt our *mind*, and that of any other species of animals. But it still remains to be inquired in what this difference consists?

In

nor is there any thing wanting of what is necessary. This I hold to be an axiom of natural philosophy, from which many great consequences are to be deduced.

In this inquiry I will follow the division, above mentioned, of the animal *mind* into *gnostic* and *orectic*, beginning with the *gnostic*, which, as I have said, is the foundation of the other.

The *gnostic* faculties are the active powers of the *mind*, by which it perceives different objects: By one kind of them, the *mind* perceives external objects through the medium of the organs of sense. These the better sort of brutes have, as well as we, as many in number, but different in degree; for every animal has organs of sense suited to the life for which it is, by nature, destined: Nor do I believe there is any one species of animals that has sensations of precisely the same degree of acuteness and intenseness that another has. Aristotle has observed, that the sense of *smell* is imperfect in us *, whereas, in some other animals, it is most acute, so that by it they perform a great part of their animal functions. The sense of *sight*, on the other hand, I am persuaded, is more perfect in us than in most other animals: For it is by it, as Aristotle has observed, that we acquire the most knowledge †; and, I think, there can be no doubt that we are by nature destined for acquiring knowledge, of which, as the same philosopher has observed, all men are more or less desirous ‡. I believe too, that our senses, both of *taste* and of *touch*, are more delicate and discriminating, than the same senses in most other animals §: And, perhaps, the same is true also of our *hearing*; at least, it is certain, that, by cultivation, we have given it a power of discriminating sounds, which no other animal has.

The

* *De Anima*, lib. 2. cap. 9.

† *Metaphys.* in initio, where Aristotle speaks of our *natural* ways of acquiring knowledge. What we acquire by *hearing* or *discourse*, he considers as *artificially* acquired; for, whatever doubts others may have about *speech* being an invention of art, Aristotle had none: And, accordingly, he makes words to be significant only by *compact*.—See his book of *Interpretation*.

‡ *Ibidem*—*Poetic* cap 4

§ Aristotle (lib. 2. *de Anima*, cap. 9.) says, that we have the most exquisite *touch* of any animal.

The *phantasia*, as I have said, is the repository of the perceptions of the objects of sense, by the means of which they operate upon the *mind*, even when the objects are not present. In this manner, the brutes are affected, as well as we. But there are two differences, which I have already observed, betwixt their *phantasia* and ours. The first is, that their *phantasia* only operates, either when the object itself is again presented to them, or, when any natural, instinctive desire, necessary either for the preservation of the individual, or the continuation of the species, excites the perception of the object in the *phantasia*; whereas, our *phantasia*, as Aristotle has observed †, is at our command, and we can, at any time, conjure up the *forms* in it; and these *phantoms* very often affect us as strongly, or more strongly, than the real objects. And, *secondly*, we can not only call up those *forms* when we please, but we can mould and fashion them according to our fancy; adding to them, or taking from them; separating or combining them, in a manner very different from their appearance in nature: And we can make them more perfect, as in the case of geometrical figures; which shows evidently, that, even in this matter of the *phantasia*, and with respect to external objects, there is a power in us, superior to any which the brute possesses; for the brute preserves, in his *phantasia*, the objects, just as he received them from nature, without making any alteration in them, for the better, or the worse.

And, as to the comparison of the perceptions of sense, a faculty, which, as I observed, the brute possesses in a certain degree, there is likewise the difference which I have observed betwixt our *phantasia* and that of the brute, namely, that the brute never makes the comparison, unless instigated by one or other of the natural desires above mentioned; whereas, man makes the comparison without any such instigation.

Further,

† Lib. 3. cap. 3. *de Anima*.

Further, we have a set of perceptions quite different from the perceptions of the brute, because the objects of them are quite different. And, as Aristotle has well observed †, where the objects of perception are different in kind, the faculty of perception must be also different. The objects I mean are *ideas*, or *generals*. These are intirely different from particular objects of sense, which only are perceived by the brute, and are things that have a real existence in nature; whereas ideas are mere creatures of the *mind*: So that here the human *mind* exerts a creative power, which, to the philosopher, must appear something very wonderful; so wonderful, that we might be thought ourselves a visionary being, without any thing real or substantial in us, if we did not consider, that it is in this way we discover the *forms* and essences of things, as far as it is possible for the human faculties to discover them, in the state they are in here below, overlaid and buried in matter, out of which we are obliged, as it were, to dig them.

Last of all, and what, more than any thing I have hitherto said, makes it evident that our *mind* is of a nature quite different from that of the brute, is the power which it has, of turning upon itself, making itself its own object, and thereby discovering its own nature ‡; and, by analogy, the nature, likewise, of superior *minds*. Now, whatever degrees of sense, or even of reason, we may allow to those superior brutes I mentioned, this faculty no body will pretend that

† Lib. 6. cap. 6. ethic.

‡ See Philoponus upon this subject, in his introduction to his commentary upon Aristotle's books *de Anima*; his words are, I think, remarkable; and, as the book is in the hands of very few, I will here transcribe them.—Οὐδὲν τῶν σωματῶν αὐτοῖς αὐτοῖς γινώσκει, οὐδὲ πρὸς αὐτοῖς ἐπιστρέφεται· οὐ γὰρ οἶδεν ἑαυτὴν ἢ χεῖρ, ἢ ἄλλο τι τῶν σωματῶν· ἀλλ' οὐδ' αἱ ἀλογαὶ δυνάμεις, καὶ τοὶ ἀσώματοι οὐκ αὐτὰς ἴσασιν. οὐ γὰρ οἶδεν ἑαυτὴν ἢ ὄψις, ἢ ἡ ἀκοή, ἢ ἄπλως ἢ αἰσθήσις· οὐδὲ ζητεῖ ποίας ἐστὶ φύσεως· ἀλλ' ὁ λόγος ἐστὶ, ὁ περὶ αὐτῶν ζητῶν, ἐν ᾧ μὲντοι ψυχὴ ἢ λογικὴ, αὐτὴ ἑαυτὴν γινώσκει· αὐτὴ γοῦν ἐστὶν ἡ ζητούσα, αὐτὴ ἡ ζητούμενη, αὐτὴ ἡ ὑπὸ τοῦ σώματος ἡ ὑπὸ τοῦ σώματος ἀφ' ἧς ἐκείνη ἀποδίδεται.

that they possess; or that they are able to *recognise* their own *minds*, or to form any notion of superior *minds*.

As to the *orectic* powers of the human *mind*, compared with those of the brute, it has these, as I have observed, corresponding to its *gnostic*; for, as it has the same *gnostic* powers that the brute has, it has the same *orectic* powers, viz. *appetite* and *anger*: But, as it has, besides, the *gnostic* power of *intellect*, either *theoretical* or *practical*, it has two *orectic* faculties, corresponding each to each of the other, but both unknown to the brute, viz. the *love* of *knowledge* or *truth*, answering to the *theoretic intellect*; the other the pursuit of what is *good*, answering to the *practical intellect*. This *good*, as I have said, is either real or apparent. If the *good* we pursue be real, and if the *mind* have strength enough to make the irrational desires (and brutal, as they may be called) of *appetite* and *anger* submit to this intellectual pursuit of what is *good*, then is the man perfect in *practice*, and what the philosopher calls a *good man*: Apparent *good*, on the other hand, is only the *good* of *opinion*, not of *nature*; for every man, as I have observed, who acts rationally, is determined by some opinion of *good*, right or wrong; so that the whole happiness of our lives depends upon our forming right opinions concerning what is *good* or *ill* in *human life*.

The brute, on the other hand, desires only what is *pleasant*, without having any idea of what is *good*: And this is sufficient for the purposes of animal life; for nature has annexed pleasure to those operations, and those only, which are necessary for the preservation of the individual, or the continuation of the kind; so that there is no harm in the animal being guided and determined in his actions by those pleasures. For, as the enjoyment of them is not heightened, as among us, by opinion and imagination, nor any improper means used to excite the desire of them, they can lead to no blameable excess; whereas we, by leaving nature, and following opinion, and

living in an unnatural manner, make even those natural pleasures pernicious to us, and contrive others, which, having no foundation in nature, cannot possibly be *good*. But this, as I have said, is the consequence of anarchy and misrule in the *mind*; by which, instead of the superior power of *intellect* governing it, the inferior passions reign in its stead.

From this account of the *brute*, it is evident, that he belongs to *nature*, not to *man*, according to the division that I have made of the things of this sublunary world *; for he cannot recognise his own actions, and therefore is intirely unconscious of what he does: Neither does he know for what purpose, or to what end, he acts, but blindly and necessarily follows appetite or inclination, which, though it lead him unerringly to what is *good*, (I speak of such brutes as are in the natural state, not of those that are tamed, and, as it may be said, civilized by us), it is a *good* of which he has no idea.

And here we may see clearly the meaning of a word which is in every body's mouth, but not understood by every body; I mean, *instinct*, which is the governing principle of the brute, by which he is directed to pursue or avoid certain things, without knowing for what purpose or to what end, and, therefore, without hesitation and deliberation; for the brute never deliberates, except in the particular case above mentioned; when he is drawn different ways by different appetites or inclinations †.

* See above, p. 85.

† *Cautus enim metuit foveam lupus; accipiterque
Suspectos laqueos, et opertum milvius hamum.*

HORAT.

On the one hand, hunger impells the animal, on the other, fear or concern for self-preservation pulls him back; therefore he deliberates. But, where there is no contrary instinct to restrain him, he always follows appetite, without deliberating or thinking of consequences as man does. See above p. 101.

We may observe here in passing, that the brute has this in common with the vegetable; that the *principle* or *mind*, as I chuse to call it, of the vegetable, does every thing necessary for the preservation of the individual substance to which it is united, and for the propagation of the kind, as well as the brute, and, like him, without knowing that it does so. But there is this difference betwixt them, that the brute has pleasure in attaining those things which nature directs him to pursue, and pain when he is disappointed of his pursuits, and meets with the contrary of what he desires: Whereas the vegetable has no sense either of pleasure or pain; and in this chiefly consists the difference betwixt the *sensitive* and *vegetable* nature:—But of this more afterwards.

To conclude this comparison of the *human* and *brute* natures, the whole matter comes to this issue: The *human mind*, though immersed at first in matter, as well as that of every other animal here below, can emerge from it; and, by exerting its native power, can act without the assistance of the body, which it is so far from needing in these operations, that it is incumbered and obstructed by it. By this power it transports itself, as it were, into that ideal world, which every man, who believes in God, must believe to be the archetype of this material world; and, in this way, may be said to converse with those eternal *forms* of things in the divine mind, of which all things we see here are but shadows. And not only does our mind thus open to itself a new world, but, by the study of its own nature, it discovers *mind* itself, and rises, as near as it is possible for us, under this load of flesh, to that supreme *mind*, the author of nature, and every thing in nature, whether ideal or material. By studies of this kind, we attain, in some degree, to what we conceive to be the divine, the chief perfection of *mind*, the ability to employ itself within itself, without the least dependence upon, or connection with, any thing external. Nor is it

possible to say, how far the human mind, by being constantly employed in such meditations, and abstracted almost intirely from the body, so disposed, by a proper diet and manner of life, as not to obstruct its operations, may go in this ascent towards *divinity*. Neither can I intirely disbelieve, though I think I am no enthusiastical visionary, the accounts delivered down to us of the progress made by Plotinus, and others of the later Platonists in that road *.

Thus much, I think, at least, we may conclude, with great certainty, from the operations of the mind while it is in the body, that when it is released from this prison of flesh and blood, it will act with much more vigour, and in a manner very different from what it does at present: For then, as Aristotle says, *it is what it truly is, that is, immortal and eternal* †. And he further tells us *what* it is in the same chapter; for he says, it is, by its nature, separable from body, unmixed, and impassive; and its essence

* This Plotinus flourished in the second century, and may be said to be the founder of the Alexandrian school. He was, I think, the greatest philosopher of later times, and a genius truly *divine*. Nor do I think that ever there was a mind, merely human, of more sublime speculation, or more abstracted from *matter*, than his was. Porphyry, his scholar, who writes his life, says, that, while he was with him, he, Plotinus, was four times raised above humanity, and united by an energy ineffable to the Divinity that is above all; *τὸ πρὸ πάντων θεῶν*. And he says, that he himself was once exalted in the same manner when he was 68 years of age. This I know will be laughed at by our modern philosophers; but, as Hamlet says in the play, 'There are more things in heaven and earth than our philosophy dreams of.'

† *Χρησθῆς δὲ περὶ μόνου, τοῦ ὅτι ἐστὶ, καὶ τοῦ μόνου ἀθάνατον καὶ αἰδιον*, lib. 3. *de Anima*, cap. 6. where the difference betwixt those two epithets is said, by Philoponus, to be this: That *ἀθάνατον* denotes, that the mind has essentially life in it; so that it cannot be without life, and be at all; and that is what we call in English *immortal*. The other epithet *αἰδιον* expresses this further, that it not only must have life always when it exists, but that it does always exist; or, as I have translated it, is *eternal*. See Philoponus's commentary upon this 6th chapter.

effence is *energy*. The meaning of which he afterwards explains, by telling us, that it does not sometimes think, and sometimes not, but always †. And I have no doubt of the truth of what Philoponus says in his commentary upon the first book *De Anima*, 'That intellect, when separated from body, has no need of the *διαλογισμὸς*, or *discourse of reason*;' because, without searching for truth, as it does now, and passing from premises to conclusion, it sees every thing immediately and intuitively, having the *forms* of every thing within itself, and not being disturbed in its operations by the body; for, says he, the body is the cause of its ignorance, and, therefore, of its search for knowledge. And, in a following passage, he says, that the mind, in that separate state, has no need of *memory* any more than of *reason*. But, says he, in this state, our knowledge is fleeting and transitory, like the body to which we are joined: We therefore need *memory*, in order to retain what we have once learned; for memory is the knowledge of what we knew before: But, in our separate state, we have the *forms* of all things, that fall within our comprehension, in the mind at once; so that there is neither first nor last in our knowledge *.

And here we may see the reason why Aristotle and his commentators ascribe only one operation to the *νοῦς*, or *intellect*, viz. *simple ap-*

† καὶ οὗτος ὁ νοῦς χωριστὸς καὶ ἀμικτός, καὶ ἀπαθής, τῇ οὐσίᾳ ὡς ἐνέργεια—ἀλλ' οὐχ ὅτι μὴ νοεῖ, ὅτι δὲ οὐ νοεῖ. Ibid. cap. 6.

* Philoponus's commentary upon the 5th chapter of the first book *De Anima*, where I think it appears from Aristotle's own words, that Philoponus has very fairly given us his sense; for Aristotle says, τὸ δὲ διανοεῖσθαι καὶ φιλεῖν, ἢ μισεῖν, οὐκ ἐστὶν ἐκείνου πάθος, ἀλλὰ τοῦδε τοῦ ἔχοντος ἐκεῖνο, ἢ ἐκεῖνο ἔχει. διὸ καὶ τούτου φθισόμενον, οὐτε μνημονεύει. οὐτε φιλεῖ. οὐ γὰρ ἐκείνου ἐν, ἀλλὰ τοῦ κοῖνου, ὁ ἀπολαύει ὁ δὲ νοῦς ὡς ἐπιστάτης τι καὶ ἀπαθὲς ἐστίν. *De Anima*, lib. 1. cap. 5. A divine sentence, and which alone ought to have acquitted Aristotle of any suspicion of Atheism or Materialism, if there had been nothing more to the same purpose in his works.

apprehension; for that is its only operation in its separated and perfect state: But as, in this state, it must necessarily operate by *discourse of reason*, and apprehend complex truth, that is, the *truth of propositions*, I have also ascribed that operation to it.

The account of the *brute mind*, in opposition to this of the *human*, is very short. He perceives only material objects, either present or absent, by the means of the *phantasia*, which I consider as a bodily organ, and a kind of secondary sense. He converses, therefore, only with *matter*, and acts only by the *body*, through the *body*, and for the purposes of the *body*; that is, for the preservation and propagation of the animal life; and all his inclinations and desires have that tendency. His *gnostic* powers, therefore, are all connected with the body; and, as to the practical part, he is, as we have seen, directed intirely by *pleasure*: And though, as I have shown, he is thus well directed, (for God has created nothing ill), yet we are to consider that pleasure is not the end of nature, but only the means she uses to attain her end, which is what is *good*. Now, it is by this that man is directed, when he *acts* as a man should *act*. And, in this respect, he imitates God and nature, when he forms a plan of action, of which the end is *good*. And, when he extends this plan beyond himself to thousands of his own species, forming a *state* or *polity* upon such a plan, he may be said to do the most Godlike act which mortal man can do, and to create something like an *universe*.

From this short view of the matter, it is evident, that there can be no more dangerous error in the philosophy of *mind*, than what has been maintained by some modern philosophers, 'That we have no ideas, but only perceptions of sense;' or, in other words, that our minds cannot *act* without the assistance of our bodies. In the *first* place, it degrades us into brutes, leaving no other difference betwixt

us and the better kind of them, except in degree ; for all that we can value ourselves upon above them, according to this philosophy, is, that we have clearer and more distinct perceptions of sense ; that we retain them longer, and compare them better together.

2dly, I apprehend this error goes very much farther ; for, as those philosophers deny the existence of ideas altogether in any mind, without making a distinction betwixt superior and inferior minds, the consequence necessarily is, that, even in the Supreme Mind, (if they allow any such to exist), there is nothing but perceptions of *sense* ; from which two other consequences necessarily result : *First*, That there is an end of that intellectual world in the Mind of the Deity, which, according to all philosophers, both antient and modern, who are not atheists, is the pattern and archetype of this material world. And, 2dly, That this world could not have been the production of God, even if we could suppose it formed without any plan or design, but must have been prior to God, or, at least, coeval with him, as it is from it that he must have had his perceptions of sense, as well as we have. Now, I think it is better to do, as Mr Hobbes has done, to give no understanding at all to the Deity, than to give him an understanding so entirely dependent on matter, and of a lower degree, than what falls to the share of an ordinary man *. But Mr Hobbes, when he reasons in this way concerning the understanding of the Deity, plainly means to deny his existence altogether : And the philosophers I speak of must have the same meaning, if they know the consequences of their own doctrine †. But, to return to the human mind.

It

* Mr Hobbes's words are, ' Quoniam scientia et intellectus in nobis nihil aliud sunt, quam suscitatus, a rebus externis organa prementibus, animi tumultus, non est putandum aliquid tale accidere Deo. Signum enim est potentiae ab alio dependentis.' (De Cive cap. 15. sect. 14.)

† The first philosopher, of modern times, who advanced this notion, of the non-existence of ideas even in mind, was Dr Berkeley, who, I have the charity to think, was no Atheist, and that, therefore, he did not see the consequence of his opinion : I cannot, however, help saying, that his philosophy, upon the whole, is the most extraordinary that ever appeared in the world. If he had denied the existence of ideas only,

It may be objected, that the human mind has all those great talents, I have mentioned, only in *power* or *capacity*, when it makes its first appearance in this world : That the brutes may have the same latent powers, though hitherto we have not discovered them ; because they never have exerted them, for want, perhaps, of opportunities, and that instruction to which we know that man owes so much ; and we have more reason to think so, that some of them, by education and instruction, are carried on very far ; and how much farther they might be carried, were due pains bestowed upon them, it is impossible to say.

That the great powers of the human mind are, at first, latent, and immersed in matter, so that the infant is no more than a man in *capacity*, is a fact that, I think, cannot be denied. Aristotle says, that, at his birth, his mind is like a tablet, with nothing written upon it, or, as we would say, a white sheet of paper. And even the Platonic philosophers, who maintain, that his ideas are not acquired here, but brought with him, acknowledge, that they are so overwhelmed at first with matter, that they lie, like sparks under ashes, which do not appear till they are stirred and roused ; and that, they say, is done by the objects of sense. And, therefore, the doctrine that I have maintained

only, and left *matter* in the world, there might have been some reality in our knowledge, such as it was, and our sensations, at least, might have had some foundation in nature ; but, when he takes away both ideas and matter, what does he leave in the place of them, but mere delusion, and an empty dream ? As to a later philosopher, who maintains the same doctrine concerning ideas, I have not the same charity for him, but rank him with Mr Hobbes, with this difference only, that he has put his atheism into a more sceptical form, and is a man of less genius, as well as less science.

I observe, too, that the French *material* philosophers, such as the author of the treatise *Sur L'Esprit*, and he that writes *Le Systeme de la Nature*, the most professed book of atheism that has been published in our time, maintain likewise, that there is nothing in our minds but perceptions of sense, or ideas of sensation, as Mr Locke calls them : And the reason is plain, that, if they should admit that the mind could operate by itself, without the assistance of the body, it might be supposed that the mind could exist likewise without the body, and that there was really a distinction betwixt *mind* and *body*.

tained elsewhere, concerning the progress of the human mind, from a state no better than mere brutality, (however strange it may appear in modern times,) is the doctrine of all the great philosophers of antiquity *: So that the only question is, Whether we do not, even at

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* There is a curious passage in Philoponus's Commentary upon Aristotle's treatise *De Anima*, lib. 2. towards the beginning, where he gives an account of the progress of man, from his conception to his maturity; which is the more to be observed, that Philoponus was not only one of the best commentators upon Aristotle, but a Christian. Man, says he, when first conceived in the womb, is no animal at all, but *αψυχον*, or *inanimate*; then he becomes an *εμψυχον*, but only of the vegetable kind, that is to say, organized, and having growth and nourishment, but without sense or motion: Then he becomes a Zoophite, having the sense of touch, and a certain movement, but without change of place, sticking to the womb, like an oyster to its shell or rock. Then, after delivery, he becomes a *ζωον*, or animal having motion from place to place, and energizing by all the senses. He is yet, however, but an irrational animal, or *ζωον αλογον*; and it is only in process of time, according to Philoponus, that he becomes *ζωον λογικον*. Nay, he is not, says this author, even at his birth, an animal of a perfect kind; for he wants the *φαντασια*, or imagination, and therefore resembles a worm, or such other incomplete animal.—That very young children want imagination, Philoponus proves in this way: A young child, says he, will suck any thing that resembles a pap, and he will come to the fire, and burn himself; and this, not once, but several times. Now, this proceeds from his not having those objects pictured in his imagination at first, as they are afterwards, when he knows the fire, and shuns it; and does not mistake a finger, or any thing else, for his mother's pap. See Philoponus's Commentary upon that part of Aristotle's 3d book, *De Anima*, where he treats of the *phantasia*.

This is the *natural* progress of man; but his *civil* progress, as it may be called, must be very much longer; the one being the progress of the *body*, which is mortal, and but short lived; the other, of the *mind*, which is immortal; the progress of the one, too, being from nature, the progress of the other depending upon culture and instruction. Even when that is adhibited, the progress, we see, is but slow; but, without that, when men, instead of being taught, must invent every thing, how very much slower will it be?

To these reasons, and to this authority from Philoponus the Commentator of Aristotle, I will add the authority of Aristotle himself, who has gone so far as to say, that the *Νους*, or *intellect*, till it has got *intelligibles*, that is, *ideas*, in it, does not exist except

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first, excell them, in *power* and *capacity*, as much as we do afterwards, by the means of culture and civilization, excell them in *energy* or *actuality*?

And, in the *first* place, *powers* and *capacities* are latent things, which are no otherwise to be known to us, except by their energies and operations. Now, it must be admitted, that no brute has ever displayed those superior talents, of which the human mind is possessed. I have allowed that they can reason, in a certain degree, by comparing the perceptions of sense, and, from that comparison, drawing certain conclusions, for the direction of the oeconomy of their lives. Thus far the antient philosophers have gone, and no farther. But, as to intellect, no antient philosopher has bestowed it upon them, nor any modern, who could distinguish betwixt the operations of intellect, and the ratiocination above mentioned. Now, nature does nothing in vain, according to Aristotle's maxim *; and, therefore, we cannot suppose that she has given to any animal a *power* that never was exerted, or which, we have any reason to think, ever will be exerted.

2do, This argument will be much strengthened, if we consider what it is that has given man the opportunity of exerting those powers, which

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διναμις, that is, in *capacity*, and is nothing at all *actually*, or *ενεργεια*. And, in that situation, he compares it to a tablet or book, in which nothing is written, and says that it is no more than the place or receptacle of *forms*. (*De Anima*, lib. 3. cap. 5.) It is evident, therefore, that, according to Aristotle's opinion, till our mind be stocked with sensations, and till we have learned, from those sensations, to form ideas by abstraction, and then to compare those ideas, we have no more intellect than a child. How long the human mind must have continued in this condition, in a state of nature, must be evident to every one who has been able to divest himself of the notions which we acquire by living in a state of civilization, and has carried back his thoughts to that original state, prior to civil life, and all its arts and sciences.

* *De Anima*, Lib. 3. cap. 10. See a former note, page 132.

undoubtedly are latent in him at the time of his birth, and which do still continue so, in many barbarous nations. This is no other than social intercourse; without which, it is evident, that the human mind would still have continued in a state very little above that of the brutes. And the more frequent and close this intercourse is, the greater the improvement. Now, we have examples of brutes living, for ages, in the most strict society, such as is not only political, but domestic, and yet exerting nothing like the *power* of the human *intellect*. The animal I mean is the beaver, whom I have already mentioned, as one of those that come the nearest to the human sagacity. This animal still lives, in the manner I have mentioned, in the wilds of America; and is, I believe, a more antient inhabitant there than any of the Indian tribes; yet they have formed no ideas, nor invented any sciences, not even arts; for, though they practise certain necessary arts, such as that of building their dikes and huts, yet they cannot be called *arts*, in the proper sense of the word, as being founded upon general principles and theorems; but are either no more than mere instinct, or at most, what Aristotle calls *πειρα*, that is, *experience* and *observation*, which, no doubt, is the mother of all arts, but is not *art*, till it be carried the length of principles and theorems*. When, therefore, opportunity and occasion offer, to call forth any latent power in an animal, and yet it is not produced into *act*, we may, I think, conclude, with great certainty, that there is no such power in the animal.

Lastly, the *beaver*, and those other animals I mentioned, as coming nearest to man, want, not only the use of speech, which I am persuaded man wanted at first, (perhaps for several ages), but the faculty of speech, because they have not the proper organs. Now, it is only, as Aristotle has observed†, by conversation, or the intercourse of *speech*, that we

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learn

* Aristot. *Metaph. in initio.*

† Ibidem.

learn any thing ; by which he means, *are taught any thing by others* : And it is certainly true that, without the use of speech, it is impossible that man could have improved his mind so much ; not so much, I believe, as to have become an intellectual creature. Now, we cannot suppose that nature would have acted so vainly and superfluously, as to have bestowed on any animal a power or faculty, without giving him, at the same time, what was necessary for exerting that power.

In this manner, I think I have proved,—That man is an animal superior to any other upon this earth in *power* and *capacity*, as well as in *energy* or *actuality*—That, in this last respect, and, as he actually exists, those faculties which he has in common with the brute, such as the phantasia, and the reasoning or comparative faculty, he possesses in a superior degree—That he has one faculty which the brute has not in the least degree, and which is very much more excellent than any that is bestowed upon the brute, viz. the intellect, which is self-moved, not by any thing from without—which operates by itself, without the assistance of the body—whose objects are things within the Mind of eternal and unchangeable existence, not things in generation and corruption—and, lastly, which can make itself its own object ; and, by recognizing itself, can rise to the contemplation of superior minds, and even of the Supreme Mind. This is that spark of divinity within us, which, properly roused and stirred, fostered, and nourished, by suitable culture, will bring us as near to the Divinity as it is possible for any mind, clothed with body, to come.

C H A P. XI.

Plato's Notion of our Knowledge in this State expressed by an Allegory—All derived from Sensation—Such Knowledge most imperfect—This illustrated by the Knowledge we get from the Sense of Sight—What Intellect can do to supply the Defects of Sense—The Knowledge of superior Minds very different from ours—What ours will be when we are disencumbered of the Body—It will be such as is incredible to the Material Philosophers—That the Mind has Perceptions in this State, even of sensible objects, proved—from our Phantasia—from our Dreams—from Appearances to us when awake—from the Case of those that walk in their Sleep—Instances of these Kinds—The Senses not the Cause of the Perception of Sensible Objects—This illustrated by a Comparison.

WHAT I hinted in the end of the last Chapter, about the state of the human mind in this body, will, if duly considered, lead us to further discoveries of the nature of our mind, and enable us to make some conjectures concerning its powers when separated from the body.

Plato has said, in more than one place, that, in this state of our existence, we perceive only the images of things, but are not conversant with the things themselves; and he has compared us to prisoners chained down in a cave, in such a manner, that they cannot turn their heads, but can only look forward towards the end or bottom of the cave. He further supposes, a great fire or light at the mouth of the cave, and betwixt them and that light, figures of men, and other animals, and of many different natural or artificial substances, so placed, that

that the shadows of them are projected upon the bottom of the cave, and which, therefore, the prisoners see, though they cannot see the substances *. This may be thought to be one of Plato's visionary notions, which amuses the fancy, without informing the understanding ; and, indeed, it is a *parable*, (a manner of teaching in which antient wisdom delighted much,) but a parable most expressive of truth and reality ; and the interpretation of the parable I take to be this :

Our ideas, by which only we know any thing, are all posterior to our sensations ; our knowledge, therefore, we have only at second hand, reflected, as it were, from material things : Whereas higher intelligences are conversant, we must suppose, with the original ideal forms, not secondary, or derived from matter, like those which are the objects of our knowledge. Thus, therefore, like Plato's prisoners, we see not the things themselves, but certain representations or similitudes of them, which may very properly be compared to shadows.

Further, the notions we get in this way, must appear exceedingly imperfect, if we consider that sensation is nothing else but the communication of motion from the external object to the mind or sentient part, through the medium of what is called the *organs of sense* ; for that all objects of sense are perceived by some impression which they make upon these organs, is a thing well known to all philosophers : And the only difference among our sensations is, that the motion from some of these objects is communicated to the organ at a greater distance, and some at a less, or in contact.

I will take, for example, the sense of *seeing*, which is our most excellent sense, and that to which, according to Aristotle's observation †, we owe the greatest part of our knowledge. I use it as an example for another reason also ; because the way in which visible objects operate

* Plato *De Repub.* lib. 7. *in initio.*

† *Metaph.* lib. 1. *in initio.*

rate upon that organ of sense, and the progress of the communication of the motion from the object to the mind, are better known with respect to this sense, than with respect to any other; for here we have discovered that the rays of light, which are reflected from the object, are received in the pupil of the eye, there refracted and converged, so as to form a picture of the object in the retina or bottom of the eye, and which, by the optic nerve being conveyed to the brain, the seat, as is supposed, of all sensation, is perceived by the mind.

From this account of vision, it is evident, that the *mind* is not conversant with the visible object itself, but only with the image, or *idol*, as the Epicureans called it, thrown off from the object. And this is made still more evident by the common experiment of a room darkened, and a lens put in a hole in the window-shutter, which receives the rays from the objects without, and, refracting them in the same manner as the pupil of the eye does, makes a picture of them upon the opposite wall. Here it is evident, that the mind only perceives images of objects: Nor is the case much altered when we come out of a dark room and walk abroad; for we carry with us a kind of *camera obscura*, in which we perceive only the images of the objects as they are painted upon the retina of the eye. Still, therefore, we know nothing of them except those *idols* of them, which, according to Epicurus's notion, fly off from their surface*, and, so far from penetrating into the inside, or essence of them, we cannot even see the surface of them near, but it must be at the distance of what is called *distinct vision*.

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* In this matter of *vision*, the Epicureans appear to me to have come nearer the truth than the other philosophers of antiquity, and even the mathematicians; for, according to Euclid, vision is produced by rays that come from the eye, not by rays that come to the eye from the object. See Euclid's Optics, and what I have further said upon this subject in the Origin and Progress of Language, vol. 1. page 26. edit. 2.

Although we cannot trace the progress of every sensation in the same manner as we do that of sight, yet we are sure that all of them affect the *mind* in the manner above mentioned, by *motion* from the object communicated to the *mind* through the medium of the organ. Now, it is evident, that, by this *motion*, or *action* of the object upon the organ, we can never discover the nature or essence of the object: And, accordingly, it is agreed among philosophers, that, by *sense* merely, we do not know the nature of any thing. It remains, therefore, only to consider what *intellect* can do in the matter. Now, it appears to me, that all that this prime faculty of the mind can do, is to collect together the different ways in which any natural substance moves our organs of sense, that is, all its sensible qualities, and to make these, or the principal of them, the definition of such substances *. But it is evident, that this definition, instead of giving us the nature and essence of the thing, gives us no more than some of its operations upon our organs of perception. These operations we collect and arrange, ascribing each to the object that produces it, and, in this way, discriminating the several things around us: But what the internal constitution of those things is which makes them proper to produce such impressions upon us, or what their nature is, otherwise than in relation to us, and so far as they operate upon us, we know not.

On the other hand, we must suppose that superior intelligences are conversant with the inmost essences of things, and perceive the internal constitution of every thing, from which are derived all its properties, and all its operations upon us and other objects. For this purpose, it is evident, that they must have faculties which we not only have

* This is the account which Aristotle gives of our knowledge of the *οὐσία*, or essence of any thing. ἐπειδὴ γὰρ ἔχουμεν ἀποδιδόναι κατὰ τὴν φαντασίαν περὶ τῶν συμβεβηκότων, ἢ τῶν πάντων, ἢ τῶν πλείονων, τότε καὶ περὶ τῆς οὐσίας ἔχομεν τι λῆγειν ὅτι μάλιστα. See what I have further said upon this subject above, page 56.

have not, but of which we have hardly an idea ; and we have still less an idea of the manner of the perception of the Supreme Mind, of which we can say no more with any certainty, except that he is not obliged to look abroad for discovering the essences of things, as inferior intelligences must do, but has within himself the *forms* or *ideas* of all things constantly present, so that he perceives them always, and at one view, without the assistance of memory or recollection, and without passing from one thing to another, as we do.

How far our minds, in this state of their existence, can ever operate in a manner any ways resembling those Superior Intelligences, or whether we can attain to any communication with such intelligences, as some philosophers have pretended to do *, I will not take upon me to determine; but this I will venture to affirm, that, if we live as we ought to do in this world, and, by the exercise of our superior faculties, disengage ourselves, as much as possible, from the body, when, at last, we are intirely disencumbered of the load of it, and come out, like the butterfly out of the worm, or the serpent in Virgil,

Positis novus exuviis, nitidusque juvena,

we shall then perceive in a very different manner, and see not the shadows only, but the things themselves ; for we shall then operate always, as we do now sometimes, by the pure *intellect*, without the use of either senses or imagination ; and shall, in that way, be conversant immediately with the ideal forms, not as now, through the medium only of our senses.

This, I know, will appear merely visionary, and no better than philosophical enthusiasm, to those who believe, that our minds, at present, can operate only by the senses. Such men will say, that they have no idea of their operating otherwise in any state of their ex-

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istence ;

* See above, page 140.

istence; and they will tell you, that, without organs of sense, we can have no perception of any kind; and, I doubt not, but that they would say the same of Superior Intelligences, even of the Supreme; for, if they believe in a God at all, they must have the same gross conception of him that Epicurus had, who could not conceive that God could see without eyes, hear without ears, and, in short, had any understanding at all without the use of senses *. But, I maintain, that, in a separate state, even the human mind will perceive, not only intellectual, but sensible objects, without the use of the senses: And I think, that there is not only reason and philosophy to convince a man of this, who believes in the existence of any thing besides matter, but also facts, sufficient, at least, to convince me, that, even in this state, the mind has this power of perception.

In the *first* place, by the means of the *phantasia*, we perceive sensible objects in this way, and that too in the most lively manner. How nature has contrived this, whether by the means of any thing material, upon which the objects are painted, as upon a canvas, or, in whatever other way it is done, I believe, it is impossible for us to discover: But it evidently shows that the mind, and not only the *intellectual*, but the *animal* mind, has, by its nature, a power of perceiving sensible objects without the assistance of the organs of sense, and when the objects are at a great distance, and far out of the reach of those organs.

But, *2do*, This power of the mind is still more manifest in the case of our dreams. What the cause is of this wonderful phaenomenon of our nature, not the less wonderful in the eye of the philosopher for being common, I do not propose here accurately to inquire: I will only say, that I do not think the cause can be what Aristotle has assigned for it, namely,

* See Cudworth's intellectual system, book I. chap. I. page 20.

namely, the motion still remaining in the organs of sense, after the sensation is gone *; for, if that were the case, our most recent sensations would be always the subject of our dreams; which, though it be sometimes the case, yet I appeal to every man's experience, whether his dreams be not more commonly composed of things that he has neither perceived by his senses, nor thought of for a great while before: Neither do I think that, by the phantasia singly, we can account for dreams; for, though the phantasia undoubtedly contain, not only recent perceptions of the sense, but very old ones, no reason can be assigned why such or such objects, rather than others, should be singled out of that repository of phantasms, as I may call it, and presented to the mind. And, *secondly*, we very often see things in our dreams, that we never saw or thought of before, and which, consequently, cannot be in the phantasia. Thus, we see persons in our dreams entirely unknown to us; and they are represented to us in so lively and distinct a manner, that, if we happen ever really to see them, we know them immediately for the persons we had seen in our dreams; and we hear of things that we never heard of before, but which we afterwards find to be realities. Of this kind, I have heard several stories; but there are two recorded by Plutarch, the one in the life of *Lucullus*, and the other in the life of *Pompey*, which I will relate as facts, of the truth of which I think there is no reason to doubt. 'Lucullus, when he was making war in Pontus against Tigranes, took Sinope, a Greek city, situated upon the Euxine sea, which some Cilicians, friends of the King, had taken possession of; but, upon Lucullus coming before it, fled in the night-time, having first set fire to the city, and killed a great number of the Sinopians. Lucullus, however, made such haste, that he caught in the city, and put to the sword, 8000 of the Cilicians, who had not time to make their escape; but the city he spared, and such of the inhabitants as had escaped the cruelty of the barbarians. This he did, on account of a dream that he had the night before, in which a man appeared to him, and bid him go on; "for," says he, "Autolycus comes, desiring to meet with you." Lucullus did not know what to make of this dream, never having heard of

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* Arist. De Insomniis.

this Autolycus. But, the next day, after he had taken the city, and was pursuing the Cilicians, who made their escape by sea, he found a statue upon the sea-shore, which they had not had time to get on board, and carry off. This statue, he was told, was the statue of Autolycus, who had accompanied Hercules in his expedition against the Amazons, and having been shipwrecked, and left in that country, founded this Greek city, which, upon his account, Lucullus spared; remembering, as Plutarch says, what Sylla had written in the Commentaries of his life, which he left with Lucullus, that he ought to regard nothing so much as what was signified to him in dreams *.

This is the story of Lucullus's dream. The other story, told by the same author, in the life of Pompey, is of a dream of a Roman called Petitius, commander of a coasting vessel, which happened to be stationed upon the coast of Theffaly, not far from Larissa, at the time when Pompey was defeated in the battle of Pharfalia; the night after which, he had a dream, in which Pompey appeared to him in a mean dress, and much dejected. This dream he was telling to some of the crew, when one of them called out, that there was a boat coming from the land towards them, and that the people in it made signs to be taken into the ship. Upon the boat's drawing near, he immediately knew Pompey by the figure he had seen of him in his dream; for Pompey, when he fled from the field of Pharfalia, had thrown away all ensigns of dignity, and dismissed all his attendants †.

There are, I know, who will reject this, and other narratives of the same kind, that might be produced, related by grave historians, not as hearsays, but as matters of fact, and this upon the credit of their system of philosophy, which is no other than *materialism*, and the disbelief of all spiritual beings. But I would have those philosophers try how they can account, upon their system, for our ordinary dreams, in which

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* Plutarchus in Vita Luculli, pag. 506. Editio Francofurti.

† Idem in Vita Pompeii, p. 658.

we certainly hear and see, and have other perceptions of sense, without the use of the organs of sense; and do no more question the realities of these appearances, than of what we perceive when we are awake, and reason and reflect upon them, in the same manner as if they were real. The account that Aristotle gives of them cannot, as I have said, be admitted. And, as to Epicurus's notion, that they are produced by thin membranes, or *exuviae*, as Lucretius calls them, which fly off from the surface of things, it is too ridiculous to be seriously refuted. There remains only, therefore, Baxter's hypothesis *, that they arise from the agency of other minds operating upon ours, while the body is at rest; a system which, however strange and improbable it may appear to many, I am not disposed to reject, at least, not till a better is found out, believing, as I do, that we are surrounded by minds invisible, and that

Millions of spiritual creatures walk the earth
Unseen, both when we wake, and when we sleep †.

But, *3tio*, Not only have we dreams of what never fell under our senses, or employed our waking thoughts, but we have visions of the same kind when awake. And here I will not entertain the reader with stories of the *second sight* ‡, which, however, I cannot entirely disbelieve, unless I could, at the same time, be convinced that there are not other minds here below, besides ours, of greater knowledge, and greater power, which may communicate with our minds, in the way that spirits communicate with one another: Neither will I relate the well known stories of the appearances to Dion and to Brutus, some time before their death, though these be so well attested, being seen, not by vulgar men, but by philosophers, and men who were far from
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* See the Enquiry into the Nature of the Human Soul, Sect. 6. p. 196.

† Parad. Lost. B. 4. v. 678.

‡ A way of foreseeing things by *vision*, in which they are represented in the manner they happen. It is well known in the Highlands of Scotland, and, as I have been informed, among other nations, who are nearer the natural state than we.

being superstitious, that, I think, they cannot be doubted of, except by those who believe, like the Sadducees of old, *that there is neither angel nor spirit*. But I will relate a story, told by a late French writer, who is certainly not an enthusiast, nor too much a *spiritual* philosopher, as the reader may perhaps suspect me to be ; for he has so little notion of our minds operating without our bodies, that he makes us not only perceive objects of sense, but form ideas, think, and reason, by the aid of certain fibres and nerves. The author I mean is Charles Bonnet, who has published at Geneva, in the year 1769, what he intitles, "Essai Analytique sur les Facultés de l'Ame." This author, in his second volume, chap. 27. page 176. relates, that he knows a sober sensible man, and of good judgment and memory, who sees, at times when he is broad awake, figures of men and women, birds, beasts, carriages, buildings, &c. These appear to him to move different ways, sometimes coming near him, sometimes going farther off ; sometimes augmenting, sometimes diminishing ; disappearing altogether sometimes, and then appearing again. All these objects are represented to him in a most lively manner, and appear to him just as if they were really present. He knows, however, that it is only a vision ; and is not, like those visionaries, that mistake what they see for realities. They are representations, therefore, which only amuse him ; but it is an amusement that is not of his own procuring ; for he is not apprised of their coming ; nor does he know what scene is next to be presented to him. — Thus far our French author. Those who account for every thing from *matter* and *motion* will, I know, suspect that these appearances were the effect of a strange disease in the man's eyes, of which tho' they can give no rational account, they will be ready to lay hold of it, rather than be obliged to have recourse to *mind*, for explaining the phenomenon. But the fact is, as related by the French author, that he is an old man, who has very little use of his eyes at all ; for, when he was far advanced in years, he was twice couched for a cataract in both eyes ; and, after recovering his sight by that operation, he lost it again by reading too much ; so that, at the time that Bonnet wrote, he had lost entirely

entirely the sight of his best eye, and, by the other, could only distinguish objects near him. If, therefore, we believe this fact, we cannot doubt but that the human mind, even in this state of its existence, not in a dream, or any ways disordered by bodily disease or madness, can perceive objects of sense, without the use of the senses.

4to, Walking in sleep is not a common phaenomenon, yet not very uncommon, and so well attested, that we cannot doubt of the truth of it. These night-walkers see every thing as well as they do when awake; but they have not the use of their eyes, which are sometimes shut; or, when they are open, they have not that motion of them which is necessary for the purpose of vision. Of one of these, there is a very remarkable story told in the French Encyclopedie, under the word *Noctambule*. He was a student of divinity in the university of Bourdeaux, and was in use to rise in his sleep, and to write and read sermons without the use of his eyes. The story is attested by the Archbishop of Bourdeaux, who thought it a phaenomenon worthy of his particular attention. And, that he might be sure he did not use his eyes, he put a covering betwixt them and the paper while he was writing and reading.

There was a phaenomenon of the like kind, concerning which I had an opportunity of being very particularly and accurately informed. It was the case of a young girl, in the neighbourhood of my house in the country, who had a disease that is pretty well known in the country where I live, under the name of the *louping*, that is, the *jumping ague*; and which is no other than a kind of frenzy, which seizes the patients in their sleep, and makes them jump and run like persons possessed. The girl was attacked by this disease three years ago, in the spring, when she was about sixteen years of age, and it lasted something more than three months. The fit always seized her in the day-time, commonly about seven or eight o'clock in the morning, after she had been out of bed two or three hours. It began with a heaviness and drowsiness, which ended in sleep, at least, what had the appearance of sleep,
for

for her eyes were close shut. In this condition, she would leap up upon stools and tables, with surprising agility ; then she would get out of the cottage, where she lived with her father, mother, and brother, and run with great violence, and much faster than she could do when well, but always with a certain destination to some one place in the neighbourhood ; and to which place she often said, when she found the fit coming upon her, that she was to go ; and, after she had gone to the place of her destination, if she did not there awake, she came back with the same certain direction, tho' she did not always keep the high road, but frequently went a nearer way across the fields ; and tho' her road, for this reason, was often very rough, she never fell, notwithstanding the violence with which she ran. But all the while she ran, her eyes were quite shut, as her brother attests, who often ran with her to take care of her, and who, though he was much older, stronger, and cleverer, than she, was hardly able to keep up with her. When she told, before the fit came on, to what place she was to run, she said she dreamed the night before, that she was to run to that place ; and, though they sometimes dissuaded her from going to a particular place, as to my house, for example, where they said the dogs would bite her, she said she would run that way, and no other. When she awaked, and came out of her delirium, she found herself extremely weak ; but soon recovered her strength, and was nothing the worse for it, but, on the contrary, was much the worse for being restrained from running. When she awaked, and came to herself, she had not the least remembrance of what had passed while she was asleep. Sometimes she would run upon the top of the earthen fence which surrounded her father's little garden ; and, though the fence was of an irregular figure, and very narrow at top, yet she never fell from it, nor from the top of the house, upon which she would sometimes get by the assistance of this fence, though her eyes were then likewise shut. Sometime before the disorder left her, she dreamed, as she said, that the water of a well in the neighbourhood, called the *dripping well*, would cure her ; and, accordingly, she drank of it very plentifully,

both

both when she was well, and when she was ill. Once, when she was ill, she expressed, by signs, a violent desire to drink of it, (for she did not, while in the fit, speak so as to be intelligible), and they having brought her other water, she would not let it come near her, but rejected it with signs of great aversion; but, when they brought her the water of this well, she drank it greedily, her eyes being all the while shut. Before her last fit came upon her, she said she had just three leaps to make, and she would neither leap nor run more. And accordingly, having fallen asleep, as usual, she leaped up upon the stone at the back of the chimney, and down again; and having done this three times, she kept her word, and never leaped or run more. She is now in perfect health.

This account I had from the father, mother, and brother, whom I examined separately and together, and likewise from the girl herself, so far as she remembered; for, as I have said, she had no memory of what passed while she was in the fit; but she remembered very well every thing that happened when she was not, and particularly her dreams. And she told me, that she slept very well at night, had a good stomach, and was in every respect well till the fit seized her. It began, she says, at her feet, and, like a coldness or numbness, crept upwards and upwards, till it came to her heart; after which she had no more sense or feeling of the condition she was in.

What I have said of this girl remembering nothing of what passed while she was in the fit, is the case of all night-walkers. It is by this chiefly that night-walking is distinguished from dreaming; and it proves to me, that the mind is then more disengaged from the body than it is even in dreaming. For it is not only without the use of the senses, but without memory, which a philosopher that I quoted above *, thinks our mind will have no need of when it is disengaged from the body.

X

What

* See p. 141.

What has induced men to believe that the mind could not perceive the objects of sense, without the organs of sense, is a mistaken notion, that these organs are the cause of our sensations, by which, no doubt, they mean the efficient cause; but I deny that they are even the instrumental cause; and, if we would speak with strict propriety, we ought not to say that we perceive, by the means of our senses, but we ought only to say, that they remove the impediment, which would else hinder our perception. It is, as if a person who stood betwixt me and an object that I wanted to see, should move out of the way: That would not be, in any sense, the *cause* of my seeing the object, though it would be that without which I could not see it *. Now, the body is to be considered in like manner as an impediment to the perception of the mind, which we may figure to ourselves as shut up in the dark room above mentioned, with five peep-holes or inlets of the light, by the means of which it perceives certain images reflected upon the wall. In this way, the impediment to our perceptions is so far removed, and a total eclipse of the mind, which would otherwise take place, prevented; but no new faculty, or even means of perception, is given.

Let me suppose a man confined in such a dark chamber from his infancy, with no other use of light but what he receives through a hole in

* This distinction betwixt a *cause*, properly so called, and that without which a *cause* could not operate, is a distinction of great importance in philosophy. It is made by Plato in the *Phaedo*, p. 74. *editio Ficini*, in these words: ἀλλὰ μὴ τί ἐστι τὸ αἰτιὸν τῆς οὐσίας, ἀλλὰ ὅ ἐκ τούτου, αἰτιὸν οὐκ ἐν ποτ' εἴη αἰτιόν. Such things are called, in the language of Aristotle, *συμβαίοντα*, or *co-causes*, because, without them, the principal causes could not operate. But, of these, a distinction is to be made; for some of them are really causes, such as the tools with which an artist works, and such as the bones and sinews of the human body, of which Plato, in the passage here quoted, is speaking, as it is by these that the mind moves the body. These are called *instrumental* causes; and they are no other than the immediate *efficient* causes of the effects produced. The other kind of these *συμβαίοντα*, and it is that of which I am now speaking, is not even an *instrumental* cause, though it be that without which the *efficient* cause could not operate, as it removes the impediment to the operation of that cause.

in the wall, in which was fixed a lens, that represented the images of things without, upon the opposite wall. And let us suppose farther, that, like Plato's prisoners, he was so chained, that he could not look at objects directly through this glass, but was only permitted to see them as reflected upon the wall : While he continued in this room, he would naturally believe that there was no other way of perceiving visible objects. But, let us suppose him taken out of the dark room, and produced into broad day-light, how great would his surprise be, to see so much greater variety of objects, and so much more distinctly too, and to handle and examine them every way ? The same we may suppose our surprise will be, when we are freed from the *camera obscura* which we carry about with us, and perceive things with so much more clearness and distinctness than when we were in it.

Thus, in imitation of Plato, I have endeavoured, by another similitude, to explain my notion of the powers of the mind, when delivered from this dark prison, in which it is at present confined. And I trust that, from what I have said in this and the preceeding chapters, I have shown clearly, that the mind has powers and faculties independent of the body, and which probably will be exerted to much greater advantage when it is disencumbered of the body : And this, I hope, will have prepared the reader for what I am to undertake to prove, in the sequel, that the mind is a substance altogether different from the body. But, before I proceed to this, I think it proper to examine what the antients have said concerning the several *parts* of the *mind*.

C H A P. XII.

The Question concerning the Parts of the Mind considered—The Word Part used in several Senses—Whether there be in Man distinct mental Substances, or only different Qualities of the same Mind—The vegetative Mind a distinct Substance from the Animal or Intellectual—The Animal distinct also from the Intellectual—All the three form together a wonderful Trinity.

BOTH Plato and Aristotle speak much of the *parts* of the mind ; and Aristotle has employed a whole chapter *, to show that Plato has not made a full and compleat division of these *parts* ; but neither of them has told us explicitly in what sense they use the word *part* ; and yet I think that was necessary, as it is a word that is used in various senses.

It is a relative word, and is always used in relation to a *whole* ; and, like all relatives, they must necessarily exist together. But there are *wholes* of different kinds ; for, in the *first* place, there is an *extended whole*, of which the parts lie contiguous, such as *body* and *space*. *Secondly*, There is a whole, of which the parts are separated or discrete, such as *number*, which, from thence, is called *quantity* discrete. *Thirdly*, There is a *whole*, of which the parts do not exist together, but only

* *De Anima*, lib. 3. cap. 10.

only by succession, such as *time*, consisting of *minutes*, *hours*, and *days*, or as many more parts as we please, but which all exist successively, or not together. *Fourthly*, There is what may be called a *logical whole*, such as a *genus*, of which the several specieses are *parts*: *Animal*, for example, is a *whole*, in this sense; and *man*, *dog*, *horse*, &c. are the several parts of it. And, *Fifthly*, The different qualities of the same substance may be said to be *parts* of that substance.

As to the first sense of the word, no body, I believe, ever imagined that the mind was *space*. And, if the reader be not yet persuaded that it is not *body*, I hope, in the sequel, to be able fully to convince him. Neither do I think that any of my readers will suppose that it is either *number* or *time*: So that it only remains to be inquired, whether what we call *parts* of the mind, be only different qualities of the same substance, or different substances, but of the same genus, viz. *mind*; for, as *mind* is a general name for a certain kind of substance, all its several specieses must necessarily be substances.

The human mind, of which only I am now speaking, is composed of the vegetable, the animal, and the intellectual minds; and the question is, Whether these three be all the same substance, of which the vegetative, animal, and intellectual powers are but different qualities? or, Whether they be different substances?

First, let us compare the vegetable with the animal and intellectual life: And this comparison is the more easily made, as, in the vegetable, that kind of life is separated from both; whereas, in all animals, the vegetable and animal life are necessarily joined; and in some, such as man, all the three: whereas, with respect to the vegetable, I think it is perfectly clear that the mind in it must be different from either the *animal* or *intellectual mind*; for, if it were the same, it would have

have the same qualities and properties, as all men, being of the same species, have the same qualities, though differing in degree. But the qualities of the *vegetable* life are altogether different from those of either the *animal* or *intellectual*; and they not only exist separately, but, when all the three exist together, the energies of the *vegetable* life are quite distinct from those of the *animal* or *intellectual*. Nor will any man of common sense say, that the power by which we grow and are nourished, is the same by which an animal perceives, desires, or shuns, or that by which a man *thinks* and *reasons*. The *vegetative* power, we know, operates best, when we neither have the use of sense nor reason, that is, in our sleep; and, if so, it is clear that it must be distinct from both.

This much, therefore, appears to be certainly true, that the vegetable mind is distinct from either the animal or intellectual. And, if so, we have at least two distinct substances joined together, and incorporated in the same individual, however wonderful it may seem. And this leads us to believe, that it is not improbable, far less impossible, that three distinct substances may be united in man. What makes the only difference in the case is, that, by the order of nature, the intellectual life cannot be without both the vegetable and animal; whereas, the vegetable can be without either of the other two; but, tho' the animal and intellectual be thus necessarily conjoined, there is nothing to hinder their being separate and distinct in their nature, as well as the animal and the vegetable.

And that they are so, I think, is evident from their different energies and operations: Nor is there any way by which we can determine, that any two substances are of the same or different species, except by their operations; especially, if they be substances that have not shape or colour, or any such quality falling under the senses.

Now,

Now, I think I have proved, in a most satisfactory manner, that their operations are altogether different.

Here, therefore, we have, in every man, a *trinity*, as mysterious, but not less certain and real, than that higher *Trinity* which stumbles unbelievers so much ; but which I shall show afterwards, is as much a doctrine of philosophy as of religion. For we have a *hypostatic* and *consubstantial* union of three distinct substances, all joined together to make one individual *intellectual being*, where we may conceive, as I find some of Aristotle's commentators * did, one principle supereminent over the rest, pure and unmixed altogether with *body* ; that is, the *Nous*, or *pure intellect*, from which, by a wonderful procession, come the other two ; the one participating little of the divine part of us, but a great deal more of matter ; the other contrariwise, partaking more of the first principle, and less of the material part.

That Aristotle believed in this trinity, as well as his commentators, I think, is evident ; for, as to the animal and vegetable mind being distinct, he appears to have had no doubt : And that he believed the intellectual to be distinct from the animal, I think is clear from several passages of his works †. And here we have discovered, in this most extraordinary compound, *man*, (for so he appears to the philosopher), a *numerical whole*, consisting of three distinct substances, joined together in a
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* See Simplicius in his commentary upon the 3d book *De Anima*, page 69. and also several other passages.

† One of these I quoted before, p. 140. lib. 3. cap. 6. *De Anima*. Another may be seen in the 2d book of the same work, cap. 2. where, speaking *περι του νοϋ, και της θεωρητικής δυναμίδος*, in comparison with the animal life, he says, *οικει ψυχης γένος ἕτερον εἶναι. και τουτο μόνον ὑδixεται χωριζεσθαι καθαπερ το αἶδιον του φθαρτου*. And, in the next chapter of the same book, towards the end, he distinguishes betwixt *λογισμος*, which, it is plain, he ascribes to other animals as well as man, and the *νοϋς θεωρητικος* ; for, says he, *περι δε του θεωρητικου νοϋ ἕτερος λογος*.

wonderful manner, and incorporated in the same mass of matter : And, if it be true, what the antient philosophers said, that *man* is a little world, there must be the same union of these three principles in the great world.

But, as there is in the great world *physical body*, not organized, but having a principle of motion in it, so also is there in our little one : And this principle of motion I comprehend under the general name of *mind* ; though Aristotle says, as I have before observed, that it is only like to mind. That it is different from any of the three principles above mentioned, is evident from its operations, by which only we can distinguish the difference of things ; for, that its operation is altogether different, not only from thought and reason, but from the operation of the animal and vegetable principle, as different as the animal or vegetable is from unorganized matter, is evident to common observation.

Thus I have shown in what sense the human mind can be said to consist of parts, namely, that it is composed of three distinct substances, united together in a wonderful manner ; but each of these substances we are to conceive as simple in itself, and indivisible ; for I am now to proceed to show, that they are each of them immaterial substances, indivisible, and, by consequence, without parts.

CHAP.

C H A P. XIII.

The Antient Philosophers made the Distinction betwixt Body and Mind, and believed that both existed—Some of them believed that Mind was corporeal, and that every Thing else was so—This the Foundation of Atheism—The Belief in incorporeal Substances the Foundation of Theism—Different Manners in which Things exist—Incorporeal Substance exists in the most perfect Manner—Objection to the Existence of Immaterial Substances, that they cannot be conceived—Answer to this Objection twofold—First, That they can be conceived—Secondly, If they could not, no Reason from thence to conclude that they did not exist.

ALL the antient philosophers, whose opinions Plato and Aristotle have mentioned concerning *body* and *mind*, agreed in the distinction that I make betwixt the two, and appear to have had no doubt of the existence of both ; for, though Democritus, and after him Epicurus, denied that there was a governing *mind* in the universe, yet neither of them doubted of the existence of the *human mind*, or that there was *thought* and *reason*, *wisdom* and *counsel*, in our little bodies, though none any where else. But the great point in dispute among the philosophers of those days was, What was the *nature of mind* ? Whether it was a *substance* different from *body*, or whether it was not *body*, but more subtile, and of a finer texture than ordinary *body* ? All the Atheistical philosophers of antiquity maintained, that there was nothing existing but *fire*, *air*, *earth*, and *water* ; and that, of one or other of these, or all together, variously modified, *mind* was made. The Theists, on the other hand, maintained, that *mind* was of a *nature* and

and *substance* quite distinct from *body*; and also, that it was the eldest of things in the universe, and every thing else produced from it. In this way the controversy is fairly stated betwixt the Atheists and Theists by Plato in his 10th Book of *Laws* *. All those, therefore, in antient times, who admitted the existence of immaterial substances, were of consequence Theists; and the same, I conceive, is the case of the philosophers of our time. For, tho' there were among the antients some Materialists who were Theists, particularly the Stoics, who, notwithstanding they believed in an all-wise and all-powerful God, maintained nevertheless, that he was *corporeal*, I have never heard of any philosopher, antient or modern, who believed in the existence of incorporeal substances, and yet did not believe in God †. If, therefore, it can be made out, that there is such a thing existing in nature as *substance incorporeal*, the consequence is admitted by all philosophers to be, that there is a God; and, accordingly, by the great Theists of antiquity, and particularly Plato and Aristotle, there is nothing so much laboured as to prove, that *immaterial substances* do exist: For, says Aristotle, if such substances do exist, the Divinity must necessarily be one of them ‡.

As,

* Plato, pag. 949. editio Ficini, where he says, that the opinion, that fire, air, earth, and water, were the whole of things, and constituted what we call *Nature*, was the source of Atheism. And, in the *Sophista*, page 172. he says, that the Atheists of his time maintained, that only what they could lay hold of, and resisted the touch, was substance, and had a real existence: And, if any one told them, that things existed which had no body, they despised him, and did not think it worth their while to converse with him.

† This is the opinion of Cudworth in his intellectual system, page 135. where, speaking of the several kinds of Atheists, he says, 'All Atheists are mere *corporealists*, that is, acknowledge no other substance besides *body* or *matter*. For, as there was never any yet known, who, asserting incorporeal substance, did deny a *Deity*; so neither can there be any reason why he, that admits the former, should exclude the latter.' And, in another passage, page 768. he says, 'That, though all *corporealists* be not therefore of necessity Atheists, yet Atheists universally have been *corporealists*; this being always their first and grand postulatam, that there is no other substance besides *body*.'

‡ Εἰπερ ὑπάρχει τις οὐσία τοιαύτη, λῆγναι δὲ χωρὶς αὐτῆς καὶ ἀκίνητος, ὅστις περιεσφαι δεικνύται, ἀταύτη.

As therefore, it is a question of the greatest importance, both in religion and philosophy, it ought to be treated with the greatest attention; and, that the nature of the question may be the better understood, and wherein the difference betwixt substances *material* and *immaterial* consists, I will begin with stating the different ways in which we can conceive things existing.

And, in the *first* place, All things exist either in *parts* or without *parts*. Besides these, there is no third way of existing; for, there can be no middle betwixt these two; nor can we conceive the same thing existing both in *parts* and without *parts*.

Of the things which exist by *parts*, there are three kinds: The first is of *things*, the *parts* of which are not *co-existent*, but *successive*, such as *time* or *motion*, no two parts of which can exist together. The existence, therefore, of such things is fleeting and transitory, and the most imperfect of all existence; for it is of so shadowy a nature, that, while we say it is, it *ceases* to be.

The next kind of things consisting of *parts*, is such whose *parts* are co-existent and contiguous. Things of this kind are said to be *extended*; for, *extension* is nothing else but *co-existence* and *junction* of *parts*. This kind of being has, no doubt, a more real existence than the other; but its existence is likewise imperfect, in as much as it does not exist all together, but each part by itself, joined together indeed, but each capable of separation from the other; so that we can say, *this* is one part of it, and *that* another*.

And this is true, not only of the
 the
 Metaph. lib. 13.
 cap. 7.—See also lib. 6, cap. 1.

* This is the account that Plotinus gives of magnitude, *παντος μεγεθους, το μιν αλλο το δε αλλο*. And Simplicius, in his commentary upon Aristotle's *Physics*, page 3, gives the

the *whole*, but of every the smallest *part*; and, as it exists, so it is generated and produced; for it is not produced all together, but one part after another *. This, therefore, is the nature of *body*, that all the parts of it, however homogeneous, are different from one another in position; and the *whole* is not one simple substance, but a multitude, or heap of substances, as many as there are parts into which it is divisible †. It is also an imperfect existence in another respect, that something always may be conceived to be added to it; so that it is never perfect or compleat in itself.

The third kind of things existing by parts is, when the parts are co-existent, yet not contiguous, or joined, but separate and disjoined. Of this kind is *number*, the parts of which are separated by *nature*, and only united by the operation of the *mind*. The *whole* of this kind is more perfect than either of the other two; for it is not divisible into parts, which are likewise infinitely divisible, but is all resolvable into parts perfectly similar one to another, which have no place or position, and which are incapable of division: From whence it is evident, that the *whole* of this kind is much more simple and uncompounded than either of the other two. But still it is divisible, at least into a certain number of parts; so that it is not an indivisible *whole*; and it has the other kind of imperfection, mentioned above as belonging to magnitude, that it is capable of further augmentation *in infinitum*; and, therefore, it is not in this respect a perfect and compleat *whole* any more than *magnitude*.

the same account of it; *μεγέθη μὴ ἀπλῶς ἁρμονικῶς οὐκ ἔστιν, ἀλλὰ ἀλλοτρίῳ τῷ μεγέθει κειμένην*. Hence it comes that the parts are situated at a distance or divided from one another; and therefore it is called *διαστάτος οὐκ ἑαυτῆς*; whereas Plotinus tells us, *Νοῦς οὐ διαστάτος ἑαυτῆς*: *Intellect is not divided from itself*.

* See Simplicius's commentary upon the first book of Aristotle *De Anima*, fol. 10. page 2, in fine.

† See more upon this subject in Cudworth's intellectual system, p. 219.

I come now to speak of that which exists without parts. And it is evident from what has been said, that this must be the most perfect existence of any ; for we cannot say of such a substance, as we can do of *body*, that *here* is a part of it, *there* is a part of it ; or that one part of it existed first, another last ; or that it is *aliud extra aliud*, *one thing without another*. Nor is it like *number*, which, though divisible into parts perfectly similar, and not having the difference even of position, is still divisible : Nor does it resemble either *magnitude* or *number* in this respect, that it is capable of addition or augmentation *in infinitum*, and therefore is by its nature undetermined and unlimited. But it is one perfect *whole*, indivisible, compleat in itself, and incapable either of augmentation or diminution. This most perfect kind of existence I ascribe, as is natural, to the *most perfect thing* : And I say, that *mind* exists in this way *.

It will, I know, be said, that such a being as I have described is inconceivable ; and those indeed must think so, who believe that we have no other faculty of perception, except *sense* and *imagination* : For it certainly cannot be apprehended by *sense*, nor pictured in the *imagination*, under any corporeal form. But, I hope, I have proved to the satisfaction of every intelligent reader, that we are possessed of a faculty much superior to those, and that by it we can apprehend what has neither *colour* nor *shape*, and *what eye hath not seen, nor ear heard*, And, I hope also, that I have so explained incorporeal substance, as to make it an object of that superior faculty, though not of *sense* and *imagination*, which it is impossible it can be.

If

* Proclus, in his commentary upon the second book of the *Timæus*, has opposed to mind what is in generation, and liable to corruption, in the following words : Το ουτ' μη όλον και μη άρκ' έσται ουτ' εν ενι την ουσίαν η την ενεργησιν έχον, γίγνεται αποσπασμα. και δια γένεσιν το τοιοδον πάσης ύφίσταται, και το εναι αυτω γιγνόμενον έστιν, αλλ' ουκ εν. τοιαυτος και ο κινητος πυρρος ουτος, και χροτος ο εν ταις κινουμεναις και η μεταβλητη φορης των ψυχων.

If *mind* were the only thing to be conceived in this manner, there might appear some weight in the objection: But, let us consider how it is with the qualities and properties of *mind*? Can any man perceive by his sense, or figure in his imagination, *thought* and *reason*, *prudence*, *justice*, or *temperance*, or any faculty or power of the *mind* of any kind? And, if the qualities of *mind* cannot be in that way conceived, how can we imagine that *mind* itself can be so conceived?

And here we may observe the difference betwixt the properties of *body* and of *mind*. Those of *body*, such as *extension*, *figure*, and *colour*, we can represent by the imagination, as we can do *body* itself; but the qualities of *mind* we cannot so represent.

Further, if we have as clear a conception of *substance* incorporeal, as we have of corporeal, what more can we desire? Now, I say, we have, to the full, as clear a conception of the *substance* of *mind*, as we have of that of *body*, and a much clearer conception of *its operations*. For what do we know of *body*, except that it is *extended*, *coloured*, *figured*, *tangible*, &c. But of what *substance* are these the properties? When any one has told me that, then will I tell him what the substance of *mind* is. But, in the mean time, I think I have made its nature sufficiently intelligible, by comparing its properties with those of *body*, and shown that they are quite opposite. And, as to the *operations* of *mind*, it is evident, that we know them much better, as we know them by the most certain and intimate of all knowledge, viz. *consciousness*.

But, suppose I should allow, that we could not conceive the manner of existence of an incorporeal substance; are we from thence to conclude, that it does not exist? This would be a very dangerous doctrine in philosophy as well as religion. Nothing, I think, is more inconceivable, than how our *mind*, or call by whatever other name
you

you please the principle of motion within us, moves our *body*; and yet nothing is more certain than that it does move it.

Suppose that a blind man should deny the existence of colours, or a deaf man of sounds, because they could not conceive the nature of them, or how they could exist; would they not be thought ridiculous? And yet they would have much more reason to deny the existence of colours or sounds, than we have to deny the existence of *mind*, or *immaterial substance*; for they might say, and say truly, that they have not the least idea, not even the most imperfect, of colour or sound; whereas, I hope I have proved, that we have at least an idea, if not a sensation, or imagination, of immaterial substance. And they might further say, that they do not, nor cannot, know any properties or quantities, effects or operations, of colours or sounds; whereas, the properties and operations of *mind*, we know with the greatest certainty, by daily experience and observation *.

The truth, therefore, appears to be, that, in our present state, we have not faculties by which we can discover the essence, or manner of existence of any thing, but only the properties or accidents of things. But we must not, for that reason, disbelieve the existence of the things, otherwise we shall believe that nothing exists, and the whole universe will be to us an *universal blank*.

Having thus removed all objections to the existence of immaterial substance, from our inability to conceive it, I will now proceed to prove that it does actually exist.

CHAP.

* See this argument very well enforced by Dr Clark, in his *Demonstration of the Being and Attributes of God*, p. 82. 4th edit.

C H A P. XIV.

Three Proofs of the Immateriality of Mind in general—the first taken from the Nature of Motion—the second from the Nature of Body—and the third from the Nature of Mind itself—The last a Demonstration ex absurdo—the other two a priori.

AS I understand by *mind*, that *motive power* which animates, not organized bodies only, such as animals and vegetables, but unorganized bodies,—which, in short, pervades the whole universe, sustains and keeps together the mighty frame, being the principle of cohesion in *bodies* as well as of *motion*, I will first give some general proofs of the immateriality of this principle, applying equally to all bodies, and then I will consider particularly the different bodies in this universe, and offer some particular arguments to prove, that the *moving principle*, however different in the several bodies, must necessarily be immaterial.

The first general proof I submit to the consideration of the reader, is built upon what I think I have already demonstrated, that what *moves* is distinct from what *is moved*; and that, where there is *motion*, there must necessarily be two things, one that *moves*, and another that *is moved*. That there is this distinction in idea at least, and that it actually obtains in all machines of human invention, cannot be denied. But I think I have given a general demonstration, arising from the nature of motion, that it obtains universally, in all the works of nature as well as of art; and therefore, that nothing can *move* itself.

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This being established, I say, that what *moves* must be either material or immaterial; for the one of these being the negation of the other, there can be no middle betwixt them, because a thing must necessarily *be* or *not be*. If, then, it be immaterial, there is an end of the question; but, if it be said to be material, then I say that it must be *moved* itself, before it can *move* any thing else; for it is only in that way that body can *move* body. If, then, it must be first moved itself, but cannot itself move itself, I ask, What it is that moves it? If it be answered, That it is another material mover, then I repeat the same question, to which the same answer must be given: And so we have an infinite series of *material movers*, without any beginning, or *principle of motion*. Now, this is absurd, and contradictory to this first principle of natural philosophy, admitted by all philosophers, antient and modern, *that nothing can be produced without a cause*. For, unless there be a first cause, of which nothing else is the cause, there is ultimately no cause at all; and we do no more than put off or remove the difficulty, without solving it, as the Indian did, when he was asked, What supported the earth? and answered, An elephant,—What supported the elephant?—A tortoise.—His answer, as the story goes, went no further. But, if he had named a million of things, each supporting the other, unless he could have named one thing, which itself needed no support, it is evident that he never would have accounted for the earth being supported.

This, I think, is a demonstration *a priori*, taken from the nature of *motion*: I will give another from the nature of *body* itself.

All body is, by its nature, separable and divisible. If, therefore, there were not something that kept it together, it would be no longer body, for it would have no extension nor junction of parts. What keeps body thus together, is called the *principle of cohesion*, which is a tendency in the several parts of the body to be joined, and to remain joined to one another; and, as that cannot be without a tendency to

move towards one another, it may be very properly ascribed to that principle of *motion* which Aristotle has made to be essentially inherent in all physical bodies. And, accordingly, all the Newtonian philosophers hold *adhesion* to be nothing else but *attraction* in contact. This principle of motion is so strong in bodies, that it often overcomes another principle by which all the bodies here on earth tend towards the earth, and which is called by our modern philosophers *attraction*; for it is by the particles of *matter*, of which bodies are composed, adhering to one another, and not falling to the ground by their natural tendency to the centre of the earth, that bodies stand erect; for, otherwise, all animals and vegetables, mountains, and rocks, and elevations of every kind, would be diffused into a horizontal plain, along the surface of the earth, like water *. And this accordingly happens, when the principle of adhesion is overcome, either by violence, or by lapse of time, in the ordinary course of nature; for then the body is dissolved, and falls to pieces. This, we see, happens every day in animals and vegetables; and, therefore, in them, this principle of adhesion is recognized by every body, and is called the life of the animal or vegetable; but it is as real in the bodies that are called inanimate, though not so generally observed and acknowledged; and may very properly be said, in the language of Aristotle, *to be a kind of life in them*. Now, I ask, What is the nature of this principle of *adhesion*? Is it material or immaterial? If it be said to be material, and to be a kind of cement which keeps bodies together, then I ask, What keeps this cement together, or gives it this cementing quality? If another cement for this cement is alledged, I repeat the question; and so I drive my opponent to the necessity of going on from cement to cement *in infinitum*. And therefore it appears, that here, likewise, unless we have recourse to an immaterial cause, there is no other cause or principle to be found; and

* As Aristotle has defined *nature* to be a principle of *rest*, as well as of *motion*, it is not unlikely that he has had in view this adhesion of bodies, which keeps them in a state which, if not at perfect *rest*, may be said to be at *rest* compared with the ordinary motions of body.

and body must *adhere together*, as well as *move*, without any cause at all *.

Thus, it appears to be proved, from the nature, both of *motion* and of *body moved*, that the motive principle is immaterial; and I will add a third proof, from the nature of *mind* itself. If mind be material, it must necessarily consist of an infinite number of parts, all different from one another, at least in position. Now, Is each of these parts mind? or, Is it not? If each of them be mind, then, in every man, in every animal, and in every vegetable, and, indeed, in every piece of matter, instead of one mind, there is an infinite number of minds. And, if so, I ask, What does the magnitude, and the consequent number of minds contribute? Would not one mind have done the business as well? And can we suppose nature so superfluously profuse, as to have bestowed upon every animal and vegetable an infinite number of minds, when one was sufficient? And another absurdity will follow, that a part will be the same thing with the whole. Again, if it be said, that each of the parts is not mind by itself, I ask, How it is possible to conceive that any number of parts, each of which is without life, sense, or motion, being accumulated, should produce life, sense, or motion? or, if it were possible to conceive this, it would be necessary to deter-

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* This argument is stated, and very well urged by Philoponus, in his introduction to his commentary upon Aristotle's books *De Anima*. It is an excellent piece of philosophy, which I recommend to the perusal of the learned reader: And I think it deserves the more attention, that Philoponus was not only an excellent Aristotelian philosopher, but a Christian, who, as Suidas informs us, wrote several books in defence of Christianity. In him, therefore, we may expect to find, not only the philosophy of Aristotle, but the philosophy of the first fathers of the church. This argument, in support of the mind's immateriality, is probably taken from Proclus, in his commentary upon the *Timaeus*. And though Philoponus carried it no farther than to the *vegetable*, *animal*, and *rational* life, yet the passage in Proclus which I quoted above, pag. 73 and 86 goes to the full length that I have carried the argument, namely, to all bodies unorganized as well as organized.

quire to make a mind *. This demonstration is of the kind which the mathematicians call *ab absurdo*, that is, from the absurd consequences which would follow, if we should suppose the contrary to be true. Now, though this kind of demonstration be not, properly speaking, *a priori*, nor so instructive as that which argues from *cause* to *effect*, and shows, not only that the thing is true, but why it is true; yet it equally proves the proposition; and therefore is as convincing.

* This is an argument of Plotinus, in his *Enneads*, p. 460: as mentioned by Cudworth in his *Intellectual System*, p. 823.

CHAP.

C H A P. XV.

Proofs in the preceding Chapter a priori—those in this Chapter a posteriori, being from the Phaenomena of Nature—Rule of philosophising in this Matter the same as that laid down by Sir Isaac Newton—Laws of Nature concerning Body—No Vis Inertiae in Body—on the contrary, a Vis Mobilitatis—The several Ways in which Body is moved—Cause of these several Motions.—One Cause material, viz. by Impulse of Body upon Body—Two things required in order that this Cause should operate—No such thing as Attraction, properly speaking—only a Tendency in one Body to move towards another—Cause of the Motion of the Celestial Bodies, according to the New Philosophy, mere Hypothesis—That Motion not to be accounted for by external Impulse of a subtle Fluid—The Aversion of our present Philosophers to Mind—In what Sense Nature can be said to produce the Motion of Bodies.—Mind essential to Nature—Motion in the Vegetable not to be accounted for by Mechanic Causes—still less the Motion of the Animal—Wonderful Power exerted by the Moving Principle in the Animal—Sensation cannot be produced by a Material Cause—Reasoning and Consciousness far less.

THE proofs in the preceding chapter, of the immateriality of the *moving principle* or *mind*, are drawn from the nature of the things to which they relate ; namely, *motion*, *body*, and *mind* ; and therefore are what are commonly called arguments *a priori*. But those I am to state in this chapter are *a posteriori*, for they are drawn from the phaenomena of nature, that is, facts falling under our observation and experience ; from which we argue backwards to their causes.

I observed, in the beginning of this work, that the science of metaphysics is founded upon physics, and, as the name imports, comes, in the order of teaching, *after physics* ; because mind, which is its subject,

ject, cannot be otherwise known to us, except by its operations on physical bodies ; so that we must first study and know these before we can know what mind is. This observation applies particularly to the question now before us, concerning the immateriality of *mind* ; for *immaterial* is a negative term, importing no more than that the subject to which we apply it, has not the qualities or affections of matter ; for, with respect to the essence of either body or mind, as I have had occasion to observe more than once before, we know nothing ; all, therefore, we can know of immaterial substances, is from matter. And again, the properties of matter are only to be known by us from sense and observation. It must therefore be laid down as a *postulatum* in this argument, that no qualities, properties, or laws of matter, are to be supposed, which are not proved to exist by observation or experience. This is a rule of philosophising adopted by Sir Isaac Newton, and which, I think, ought to be invariably followed in all inquiries of every kind concerning nature.

But, tho' I adopt Sir Isaac's rule of philosophising, I cannot so readily agree with what he lays down as laws of nature concerning *body*, particularly that law which asserts, that there is a *vis inertiae* in *matter* or *body*, (these two being the same in the language of his philosophy) ; for I hold it to be contrary to the rule of philosophising above mentioned which he has prescribed to himself ; because it is evident, from common observation, that every *body*, that we are acquainted with, is either in *motion*, or has a tendency to be in *motion*. If, therefore, by the *vis inertiae* is meant a tendency in *body* to continue at rest, which is the only proper meaning that can be given to the word, it is manifestly repugnant to the phaenomena of nature ; from which it appears, that there is no *body* that has a tendency to rest. Or, if the meaning be, as I believe it is, that bodies persevere in the motion that is given them, either by nature or external impulse, till some contrary force either gives them another motion, or stops their motion altogether, the

the proposition is true ; but I think it must be owned that it is ill expressed *.

Laying it down, therefore, as a certain fact, that all bodies we know are *moved*, or, at least, have a tendency to be *moved* ; and that, so far from there being a *vis inertiae* in them, there is in them a *vis mobilitatis*, let us next inquire into the several ways in which they are *moved*. And it appears to me, that Aristotle's division is full and compleat, viz. that they are moved, either in a straight line, a circular line, that is, a line revolving into itself, or in a direction mixed of

* I have heard a better name given to this quality in body, viz. *vis perseverantiae*, or, as we may express it more simply in English, *resistance* ; which undoubtedly is an essential property in body ; for, if body were altogether soft and yielding, it would be incapable of either impelling or being impelled. The consequence of this would be, that we could have no sensation, or perception of body by our senses, which is produced by impulse upon the organs of our sense, either immediately by the body perceived, as in the case of *touch* and *taste*, or mediately, by the intervention of other bodies, which are repelled by the body perceived, and, in that way, the motion communicated to our organs, as in the case of *sight*. And, further, there could be no motion of body by impulse of other body, because, if there were no resistance in body, there could be no impression made upon it.

With *resistance* are necessarily joined two other qualities of body, viz. *solidity* and *impenetrability*. By the first of which is meant, such a junction and cohesion of parts, as necessarily make resistance to any impression ; and, by the other, the impossibility that any two particles of matter should occupy the same space, which would be the case, if one of them could so penetrate the other, as perfectly to incorporate with it. These are qualities of matter, which we are sure, from observation and experience, that it possesses : And therefore we may lay them down as the basis of our reasoning upon this subject, according to the rule of philosophizing above mentioned.

I have elsewhere in this work, (pag. 29. 30.) observed an inaccuracy of expression, likewise, in another law of motion laid down by Sir Isaac Newton, that 'action and re-action are equal.' That I am right in the sense I have given to that axiom of the Newtonian philosophy, I will not positively affirm. But this I think I may venture to affirm, that it is not expressed so clearly as an axiom ought to be expressed : And, in general, I cannot help observing, that Sir Isaac, though he may have been as good, or perhaps a better geometer, yet he was not such a master of language as Euclid, in whose elements there is a propriety and brevity of expression which I have often admired.

of these two *. Aristotle supposes, that the motion in the straight line is either *to* the center, as heavy bodies are *moved*; or *from* the center, as light bodies are *moved*. But, had he observed those motions of the small particles of matter which chemistry exhibits, he would have been convinced, that bodies have a tendency to move, both *to* and *from* one another, in every direction; and Empedocles, who made friendship and enmity two of the principles of nature, would have seen his hypothesis wonderfully verified in the attractions, as they are called, and repulsions of chemical bodies. These are the facts which must be the basis of any system of philosophy upon this subject; but they are no more than facts; and philosophy is the knowledge of *causes*. We must, therefore, inquire what is the *cause* of all those various motions of body.

And one *cause* is obvious to common observation, namely, *matter* acting upon *matter*. For, that one body moves another by *trusion* and *pulsion*, or, as it may be expressed in one word, by *impulse*, is a fact of daily experience. And, not only are all the works of art performed in this way, but a great part of the business of nature is carried on by *motion* communicated from one body to another; for, that there is a great deal of machinery in nature, is known, not only to men of science, but to every common observer. We may therefore lay it down, as a law of nature, that *body moves body by impulse*.

But, for this purpose, it is necessary, in the *first* place, that the *body moving* should be *moved* itself, and by some other *cause* than itself; as I think I have demonstrated, that nothing can move itself. This *cause*,

* Πάντα τα φυσικὰ σώματα καὶ μεγάλα καὶ ὀντα κινεῖται λιγυρῶν ἢ καὶ κατὰ τόπον· τὴν γὰρ φύσιν κινήσεως ἀρχὴν φεμὶν εἶναι αὐτοῖς. πάντα δὲ κινήσις, ὅσα κατὰ τόπον, ἢ καλουμένη φεμὶν ἢ εὐθεῖα ἢ κυκλική, ἢ ἐκ τούτων κινήτη ἀπλῶς γὰρ αὐταὶ δύο μόναι. De Coelo, lib. 1. cap. 2.

cause, therefore, assigned to motion, does not account for the beginning of it, but only for the continuance or propagation of it. For, if we should say, that this motion, by *impulse*, goes on *in infinitum*, *body still impelling body*; in the first place, this would be to give no beginning to *motion*; and, in the second place, it would be to assign no cause for it, because, as I have shown, an infinite series of causes is no cause at all.

2dly, In order that body should move body by *impulse*, it is of necessity that the two bodies should be in contact; for this is implied in the nature of *motion* so produced. To suppose, therefore, that body *attracts* body, or operates upon it any way at a distance, is a mere hypothesis, not supported by any phaenomena of nature, contradictory to that fundamental law of nature, according to the Newtonian philosophers, which lays it down, that there is a *vis inertiae* in all matter; instead of which, *attraction* supposes an active principle in matter. And, further, I say, it is absolutely inconceivable, that a thing should act or operate in any way where it *is not*; so that it is not only a mere supposition, but an impossible supposition.

It is commonly said by the Newtonian philosophers, that they do not pretend to account for the *cause* of attraction, but they only speak of it as an *effect*. But an *effect* is a *fact*; and I deny the fact, that one body attracts another. Attraction, therefore, is not, if they please, an *occult* cause, though there be very many such in nature, I mean causes unknown to us. Nor do I think that Aristotle, when he speaks of *occult causes*, means to conceal his ignorance, but to profess it. But it is, what is worse, an occult fact; which ought to be proved so much the more clearly, by how much the cause of it is not only unknown to us, but altogether inconceivable.

It is no doubt true, that bodies are *moved*, or have a tendency to *be moved*, towards one another *. A stone, for example, falling from a height, is moved towards the earth ; and, if any thing oppose it, and prevent it from falling, still it has a tendency to be moved that way, which is what we call its *weight*. This is the fact, and all the fact. But, to suppose that the earth attracts the stone, is mere hypothesis : And it might as well be supposed, that, when I move towards any body, I am attracted by that body ; for, we are not to suppose that the motions of natural bodies are at random, and without any certain direction. This, indeed, is very often the case of our motion, but never of any thing guided by nature. But, because the motion is in a determined direction towards a certain object, we cannot say that it is attracted by that object, unless we have a mind to speak in a figurative and poetical style.

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* It is in this way that Sir Isaac Newton himself has explained attraction. Hanc vocem *attractionis* ita hic accipi velim, ut in universum solummodo vim aliquam significare intelligatur, qua corpora ad se mutuo tendant, cuicumque demum causae attribuenda sit illa vis. *Principia Philos. Schol. generale, sub finem.* And Dr Clark, in his controversy with Mr Leibnitz, (5th Reply, p. 355.) has said, in like manner, that, by *attraction*, he only means the tendency of bodies towards one another, which he says, very truly, is a fact or phaenomenon of nature that cannot be disputed. But, if no more is meant, why use the word *attraction*, which certainly denotes an active force, by which one body operates upon another ? Why not call it, what it truly is, a tendency to be moved ? And, though we should not dispute about words, when the meaning is established, yet I doubt this improper use of the word *attraction* has led, not only the vulgar, but even some philosophers of the Newtonian school, since the days of Sir Isaac and Dr Clark, into some obscure notion of an *active power* in matter.

But, further, though I admit that there is such tendency in a stone to fall to the earth, because, in fact, we know that it does fall to the earth, if nothing prevents it, yet I deny that there is any such tendency in the planets to fall into the sun ; and all that we know of the matter is, that they are moved round him in certain orbits. I say, therefore, that attraction, even in the sense of *tendency* of bodies to be moved towards one another, is, with respect to the celestial bodies, a mere hypothesis.

As to the motion of the planets, it is supposed by the new philosophy, to be composed of two motions, the one a *projectile motion*, and the other an *attractive*: And the hypothesis is, that they were at first moved by God Almighty, in a straight line; but that, by the attraction of the sun counteracting this rectilineal motion, they are moved in an ellipsis round the sun. But this, as I have said, is mere hypothesis; for, in the first place, how can it be known that they were at first impelled in a straight line, and did not move from the beginning in the same way they do at present? 2dly, There is no reason to suppose that the sun attracts them, though they are moved round him, any more than to suppose that, because I go round a certain object, I am attracted by it*.

If, therefore, we will renounce hypothesis, and speak no more of *combined motions*, or of *centripetal* and *centrifugal force*, but adhere to the plain fact, which is simply this, that bodies move in different directions, and by different kinds of motion, it only remains to be inquired, What is the cause *efficient* of those various motions? Whether it be immaterial, as I suppose it to be, or material? for one or other of them it must of necessity be. And we are so far advanced in the inquiry, as to have discovered that, if it be material, it must necessarily operate by the *body moving* impelling the *body that is moved*.

Now, in the first place, I say, in point of fact, that there are no phaenomena which lead us to believe, that either a stone falls to the ground, or the celestial bodies are moved, by any external impulse of other bodies. I know that Sir Isaac Newton did attempt to account for these motions, by a certain subtile fluid, which he thought was sufficient to produce such wonderful effects. But, I believe, all his

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followers

* See what I have said on this subject in the preceding note, and what I shall say further upon it in another chapter of this book.

followers have given up this way of accounting for these motions ; and, indeed, Sir Isaac only proposes it as a query or conjecture * ; so that, according to this philosophy, as it is now generally received, there is no cause so much as pretended to be assigned for either of these movements. But, *2dly*, Suppose that the existence of such a fluid should be admitted, and its efficacy to move such ponderous bodies, still the question recurs, How is this fluid itself moved ? and there are but two ways of answering that question ; either by admitting an immaterial cause, or by supposing another subtle fluid, which is to move the first fluid ; and so on, *in infinitum* ; which, as I have observed, is not accounting for the motion, even by an hypothesis.

I must own, I think there is some truth in Dr Cudworth's observation†, that the philosophers of this age are seized with a kind of *pneumatophobia* and *hylomania*, a desperate aversion to *mind*, and a passionate love for *matter* ; for, how else can I account for their supposing, without either proof or probability, the existence of a fluid, and a fluid too of so extraordinary a kind, as not to have that property which they say is common to all bodies, I mean *gravitation*, rather than employ, for solving the phaenomenon, a power which we are sure exists in nature, and which they admit produces motion, at least of one kind, I mean the *animal motion* ?

But, suppose we should admit the existence of this invisible fluid, How can we conceive it to produce the effects ascribed to it ? It is a known law of motion, that, when body moves body, the force is in proportion to the mass and velocity of the *moving body* ; or, as the mathematicians express it, in a *ratio* compounded of its mass and velocity. Now, setting aside the motion of the celestial bodies of such prodigious mass, and which are moved with such wonderful velocity, let us consider the common phaenomenon of heavy bodies falling to the earth. This phaenomenon is so common, that it does not so much

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* Newton's Optics, second edition, *in fine*.

† Intellectual System.

as draw the attention of the vulgar : But it is not, for that, the less wonderful in the eyes of the philosopher ; for he knows that there can be no effect without a cause, and that the cause must be correspondent to the effect, and of efficacy sufficient to produce it ; and that, therefore, when a tower falls to the ground, perhaps in a solid mass, or when a rock, of some thousand tons weight, tumbles from the top of a mountain, carrying every thing before it that stands in its way, there must be some power that impells it. Now, if this power be that supposed fluid, how prodigious must its mass, or its velocity, or both, be, to produce so extraordinary an effect ? and it is to be observed, in the motion of those falling bodies, that their velocity, and, by consequence, their force, always increases, as the time of the motion continues, contrary to all other mechanical motions, which decrease, and grow weaker, the longer they are continued, and the farther they are propagated or carried on ; so that here we have an invisible fluid, acting, not only with a prodigious force, but indefinitely, and with an accumulating force. A philosophy of this kind does not explain nature, such as God Almighty has made it, but creates a new world, and makes new laws of *matter* and *motion*. And, indeed, it is to be wondered, that Sir Isaac should have proposed, even as a query, this cause of motion, after he had refuted so solidly Des Cartes's system of vortices ; for Sir Isaac's fluid is liable to the same objections which strike against those vortices ; *first*, that there is no proof of its existence, and, *secondly*, if it did exist, it would not answer the purpose.

This proof, from the phaenomena of nature, applies equally to motion of all bodies, whether animate or inanimate, as they are commonly called : Nor, indeed, do I think that any distinction can be made betwixt them, as to the question, Whether the principle of motion be material or immaterial ? Though I know it is very common to make a great distinction, and to say that animal bodies are moved by *mind* and by *intention*; whereas inanimate bodies are moved by *nature*.

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But what is *nature*? I say, it is nothing else but mind in body, and operating by the means of body; for I make this distinction of mind, —I say, that it exists by itself, detached from all body, or, at least, operates by itself: or, otherways, it exists in body, and never operates but by means of body. Mind, existing without body at all, and, by consequence, operating without body, is the *Supreme mind*, or whatever other higher intelligences we may suppose subordinate to that *mind*. *Mind*, again, joined with *body*, but able to operate without the assistance of *body*, is such a *mind* as the *human*. And, *lastly*, *mind* in body, and operating always in and through body, is what I call *nature*. In this manner, I consider mind and nature as inseparably connected; and, if we separate them, we must introduce into nature, either blind chance, or mere mechanism; that is, in other words, we must be Atheists.

The more various and complicated the movement is, the more unlikely that it should proceed from any material cause. Now, the movements we have hitherto been speaking of, are simple, compared with that by which a vegetable body is nourished, grows, and propagates its kind. And, accordingly, I do not know that any philosopher hitherto has so much as pretended to account for the growth, nourishment, and propagation of a vegetable, by causes merely mechanical; yet I do not think that a vegetable life is generally acknowledged by our modern philosophers, though it was so by all the antients, who were not Atheists.

As to the animal life, I think it is generally allowed by the philosophers of Britain, to proceed from a principle immaterial. Those who would make a machine of the animal body, do not appear to me to understand thoroughly what is called a *machine*, or to distinguish rightly betwixt a machine and its moving power. A machine or engine is nothing else but *A certain disposition or arrangement of pieces*
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of matter, so put together, as to communicate and convey the motion from the moving power to the body that is moved ; so that the machine, properly so called, is what is intermediate betwixt the moving power and the body to be moved, and is as different from the one as it is from the other. This distinction is evident in machines of human construction ; for the lowest mechanic, and even the common observer, readily distinguishes betwixt the machinery and the moving power, whether that be *air*, *water*, *vapour*, or what we call *gravitation*. Thus, in a clock, nobody confounds the wheels and pulleys with the weight or poise which makes them move. But the philosopher goes farther, and inquires what is the power that moves the poise ? And, if we make the distinction, in machines of our own invention, why not in those machines made by God Almighty, such as an animal body ?

For, that there is a great deal of machinery in an animal body, it is impossible to deny. Anatomy very clearly shows us, that its movements are performed by the means of muscles, sinews, and bones ; and, besides these solid parts, there are no doubt many subtile fluids of different kinds, by which a great part of the animal oeconomy is carried on, but the operations of which are not so easily perceived. But all this mechanism is distinct from the moving power. For, let the machine be ever so various and complicated ; let the animal spirits, or *succus nervus*, as it is called, be taken into the play, in order to give as much aid as possible to our materialists ; let the motion be continued and propagated through ever so many different bodies ; still there must be some power which begins the motion ; and that power, I say, is an immaterial principle, which I call *mind* ; and which always moves bodies, though it may not act immediately and directly upon them, but by the intervention of organs and instruments, to us often imperceptible.

Further,

Further, the force exerted by *mind*, in the animal body, is such as is impossible to be exerted by any material cause operating in so small a space ; for the bones of any animal that raises a weight, are so many levers which the muscles move by the means of the sinews. For example, when a man raises and holds out any weight with his extended arm, the bone of his arm below the elbow is the lever ; the fulcrum, or center of motion, is the joint of the elbow ; and the *power* operates by sinews or tendons inserted into the bone below the elbow, and near to it ; which sinews are moved by a great muscle above the elbow : The lever, therefore, here, is one of that kind where the *power* has the disadvantage ; for the learned in mechanics know, that there are three kinds of levers, in two of which the *power* has the advantage, that is, a *power* of less mass or quantity of matter will move a weight of greater : But, in the lever of the third kind, the *power* acting betwixt the fulcrum and the weight, the *power* has the disadvantage, and therefore must be a greater quantity of matter than the weight. Now, the human arm is a lever of this kind, and the *power* of this lever has the greater disadvantage, that it is very near the fulcrum, and at a great distance from the weight ; in so much, that Borelli * has shown, that, in order to support a pound weight, which a man holds out with his extended arm, there must be, by the laws of mechanism, a force of 70,000 pounds. Now, a strong man can hold out in his hand two stones, which, according to this calculation, will require a *power* to raise it, by a lever of such a construction, of no less than 140,000 stones. So great a *power*, exerted by mind in so small a space as the human body, may, I think, enable us to form some conception how superior minds, in the great expanse of heaven, may move those vast bodies with such incredible celerity. What the machinery may be there, we cannot tell ; but the same ingenious author has demonstrated, that, if the animal machinery were so contrived, as to give the *power* all the advantage that it commonly has in machines of human invention, not only the animal would be monstrously deformed, but

incapable

* Borelli de Motu Animalium.

incapable of moving. Now, if the power here be material, and its operations mechanical, I ask, How is a mass of matter of such power to be contained, or to operate in our little bodies? And here, again, it appears, that the materialists, in order to support their system, must ascribe powers to matter hitherto entirely unknown, and invent new laws of motion and mechanism.

But neither is this all; for an animal not only moves its own and other bodies, but it perceives, and, not only objects *present* by its senses, but objects *absent*, by the means of that wonderful contrivance of the *phantasia*. And further, it has appetites and desires which impel it to every action that is necessary for the preservation of the individual, and the propagation of the species. Now, let us suppose, for once, that the motion of the animal is produced by matter, either moving itself, or moved by some other matter; I ask, by what laws of matter or motion, hitherto discovered, can perception of objects absent, as well as present, be produced, and likewise appetites and desires? If *matter* alone can produce these wonderful effects, it must be either when it is at *rest*, or when it is in *motion*. While it continues at rest, nobody will say, that, by the power of its own nature, it ever can become *sentient*, or have appetites and desires. It must, therefore, for that purpose, be put in motion; but it is impossible to conceive that, simply by being moved quicker or slower, or in any, or in all directions, it should acquire these qualities. A body, then, by itself, whether at rest or in motion, cannot become *sentient*. It must, therefore, for that purpose, impel some other body; and what will that impulse produce?—*Motion*.—And what will that *motion* produce?—*Change of situation, of bulk, or of figure*, in the body impelling or impelled.—In one or other of these ways, are all the various qualities of bodies, affecting our senses in so many different ways, produced. Let, therefore, the motions, concourses, embraces, justlings, shocks, concretions, secretions, of bodies, be ever so various, and as complex as it is possible

to imagine, still they can produce nothing more than motion, and the consequent alteration of situation, bulk, and figure: And, whoever will venture to affirm, that they can produce any thing else, I will venture to affirm, that he speaks without ideas, and does not know what he says; for, as all our ideas are from nature, if he speaks of any production that is not to be found in nature, he speaks without ideas.

But, if sensation, appetite, and desire, and all the other things belonging to the animal nature, cannot be accounted for by material causes, what shall we say of the operations of *intellect*? How can we conceive that matter, either by itself, or acting upon other matter, shall produce thinking and reasoning; shall form *ideas*, which are things altogether immaterial, and go thro' the long process (as it often is) of comparing them together, and making inferences and conclusions from that comparison? Or, if all this could be accounted for from material causes, What shall we say of the power of *reflection* which our *mind* has, by which it perceives and recognizes itself, reviews its own operations, approves or condemns itself; which last use of the reflecting power is what we call *conscience*? Now, if all this can be produced by matter and motion, then we may say, as Lucretius says, 'That any thing may be produced by any thing *.' In short, it appears to me, as I said before, that, in order to support the cause of materialism, the whole system of nature, as it is at present, must be overturned, and a new world created. And, indeed, it must be so, if, according to my system, *mind* is principal in the universe, and *matter* only subservient to its uses and purposes.

In this manner, I think, I have proved, both by abstract reasoning, and from the phaenomena of nature, that the principle of motion in this universe, whether in bodies organized or unorganized, is immaterial. And this last proof from the phaenomena, though it be not directly and immediately from the nature of the thing, and that there-

fore

* ————— ex omnibus rebus

Omne genus nasci posset. —————

Lib. 1. ver. 160.

fore I have called it a proof *a posteriori*; yet it appears to me to be as convincing as the proof *a priori* contained in the preceding chapter; for the amount of it is this, That, whatever is moved, must be moved either by body or mind. It is not moved by body; therefore it must be moved by mind. This is a demonstration of the same kind with those demonstrations of the mathematicians, which prove, that one line, or one figure, is equal to another, by proving, *1st*, That it is not greater; *2^{dly}*, That it is not less. The necessary consequence of which is, that it is equal. Nor do I think, that the demonstration here can be evaded, otherways than by supposing, either that body may be moved in some third way of moving bodies, never heard nor thought of, or, that body may move body otherways than by impulse. Now, if, in order to evade any argument, it be allowed to make suppositions of things, the existence of which is not only not proved, nor probable, but of which I deny that any man can have so much as a conception, I ask, What can be proved in physics, or in any thing else?

The next thing to be considered, is, Whether this immaterial principle of motion exists in body only, or separated from body, and by itself? a subject of very great importance, both in religion and philosophy; and which, therefore, very well deserves a chapter by itself.

C H A P. XVI.

Concerning the separate Existence of Minds—Aristotle's Doctrine upon this Subject—The Moving Principle in Bodies unorganized, and in Vegetables, cannot exist separately—More Doubt as to the Animal Mind—Separate Existence of the Intellectual Mind or Soul clearly proved from its Energies—Immortality of the Soul also evident from its Nature.

IT might appear that this question was already determined, by our having proved, that the principle of motion was immaterial. And accordingly Philoponus tells us *, that a certain Platonic philosopher, who lived some time before him, Numenius, was of opinion, that the *vegetable* and *animal life*, as well as the *intellectual*, had a separate existence. But this is a consequence that does not follow; for the principle, though immaterial, may, by its nature, be so essentially connected with *matter*, as never to exist without it. And Numenius's argument will go so far as to prove, that this principle in unorganized bodies, which does nothing else but move them, has likewise a separate existence. But this, I believe, no philosopher ever dreamed of. I think, therefore, that the rule laid down by Aristotle must be followed in this case, that, wherever there is any energy of *mind* (so I translate ψυχή) which is peculiar to it, and not connected with body, it may exist separately; whereas, if there be no energy of that kind, but

* Philoponus, in his Introduction to his Commentary upon Aristotle's Books *De Anima*.

but all its energies are necessarily connected with body, then it has no separate existence *.

For understanding this rule the better, there are three things to be distinguished—the *essence* of the thing, by which it exists, and is what it is,—its faculties,—and, lastly, its energies or operations. Of these, the two last must necessarily depend upon the first; for, from the essence of every thing, must proceed both its faculties and energies. But, as we cannot discover the essence of any thing, except from its energies and operations, we must, in this case, consider what the energies of the several minds are, from which we can reason, both concerning their faculties, and their essence or existence; for faculties or powers are hidden things, as well as essences, and not otherways discoverable, but by the exercise of them. Now, there are *minds* which energize only in conjunction with body, and which have no faculties that do not operate by body; From whence I conclude, that those *minds* have no separate existence; for it would be in vain for them to exist, if they did not energize; and, as Aristotle tells us, nature does nothing in vain †. According to this rule, therefore, it is impossible that the mind which informs unorganized bodies can have any separate existence; for, as it does nothing but move body, no reason can be assigned why it should exist without body. The same reason will apply to the *vegetable life*; for we cannot conceive to what purpose it should exist, without some body to nourish, to make grow, and to continue by propagation.

As

* Aristotle's words are, Εἰ μὴ οὐ γὰρ τί τῶν τῆς ψυχῆς ἐργῶν ἢ παθημάτων ἰδίον, ἀλλὰ κοῖτον αὐτὴν χωρίζεσθαι· εἰ δὲ μὴδὲν ἴδιον αὐτῆς, οὐκ αὖτις χωρίζεται. Lib. 1. περὶ ψυχῆς. And, in another place, Ὅσαυτ' γὰρ ἴστιν ἀρχὴν ἢ ἐνεργεῖα σωματικῇ, δὴλον ὅτι ταύτας αὐτὴν σωματικῶς ἀνάγκη ὑπαρχειν, οἷον βυδίζειν αὐτὴν ποδῶν. That is, 'Whatever principle operates *bodily*, or with body only, that principle cannot exist without *body*, any more than *walking* can be without *feet*.'

† μὴδὲν ἢ φύσις ποιεῖ ματὴν, μὴτε ἀπολέσει τὴν ἀναγκαιότητα.—De Anim. Lib. 3. cap. 10.

As to the animal, there is more doubt; because the animal nature appears not to be so entirely joined with *matter*, but they may be conceived to be separate; for the animal has *imagination* or *phantasia*, which, as it operates without the senses, as well as the *Nous*, or *intellect*, Aristotle calls *Nous παθητικός*, or *passive intellect*; giving it the name of *intellect*, because it hath within itself the subject of its knowledge; but adding the epithet of *passive*, because it is, by the impressions, and, as it were, the signatures of sensible objects made upon it, that it knows things, as his commentator Philoponus has observed *. And the animals of the better sort, as we have seen, compare their perceptions and reason in a certain degree, which is an operation altogether distinct from body. On the other hand, it may be said, that all the operations of the mind of the animal relate only to body, and to external things, which are necessary, either for the support of the individual, or the propagation of the kind. These arguments, on both sides, have induced some of Aristotle's commentators, particularly Philoponus, his Christian commentator †, to divide the matter, and to admit, that the mind of the animal may exist without the body which at present it inhabits; but that it must necessarily have some clothing or covering of body, but *body* much more subtile, and of a finer texture than the bodies of animals upon this earth, and which, therefore, they call a *spiritual body* ‡.

As what energizes only in conjunction with matter, cannot exist without matter, so, according to Aristotle's rule, what energizes by itself, and without matter, must, by its nature, be capable of a separate existence, though, for the time, it be united with *matter*. And, indeed, while it acts and energizes by itself, it may be considered as existing by itself; because every thing that acts does so far furth exist.

Besides,

* Philoponus's Introduction to his Commentary on Aristotle's books *De Anima*.

† Philoponus, ubi supra.

‡ *πνευματικὸν σῶμα*. See Philoponus, in the passage above quoted.

Besides, it would be absurd to suppose, that the energies of any thing, which are but the third in order from its essence, should have the dignity and pre-eminence of a separate existence, and not the substance or essence itself. Now, that our intellectual mind, or *soul*, as I would chuse to call it in one word, does act by itself, even while it is confined in this prison of flesh and blood, I think I have proved beyond all doubt; for, supposing that any one should still doubt of the soul's being able to perceive even objects of sense, without the assistance of the senses, and by its own natural power of perception, notwithstanding both the reasons and facts that I have mentioned to prove it, the operations of the intellect upon those objects are, in my apprehension, of themselves sufficient to prove its separate nature and existence. And we might as well maintain, that the statuary was of the same nature and substance with the block of marble upon which he operates, as that the intellect is of the same nature with the bodies upon which it exercises its faculties. But, when we further consider, that the mind operates upon itself, and is in so far independent of all things from without, and wrapped up, as it were, in itself, I think there cannot be the least doubt, but that it exists in the same manner, unmixed, as Aristotle says, with any thing else *.

And

* Cicero appears, to me, not to have fully understood this reflecting power of the *intellectual mind* or *soul*, when he compares the soul to the *eye*, which, he says, sees all things but does not see itself. *Non valet tantum animus ut seipsum ipse videat: At ut oculus, sic animus sese non videns, alia cernit. Tusculan. Quæst. lib. 1. cap. 28.* For Cicero was not so far advanced in philosophy, as to have any distinct conception of immaterial substance: And, accordingly, in this very book, (cap. 26.) he supposes that the human mind, and even God himself, is of the substance of *air, fire*, or of Aristotle's fifth element. The fact is, that the only fashionable philosophies at that time in Rome were the Epicurean, the Stoic, and those of the old and new Academy. Now, it appears that the books of philosophy which Cicero studied the most, next to those of his own sect, which was that of the New Academy, were the books of the Stoics, who maintained that all *mind*, even the Divinity itself, was nothing more than a subtle fire. As to Aristotle, he tells us, in another place, viz. the beginning of his *Topics*, that his philosophy was very little studied at that time, even by the learned, and his books very rare. Some of them, however, it appears he had read, particularly his *Physics*, and his books *De Coelo*; where, having found

And here, again, we may observe, of what importance, both to religion and philosophy, the distinction is, betwixt the operations of our mind in conjunction with body, and its operations separated from body—that is, betwixt *sensations* and *ideas*; for, without that distinction, it appears to me, that philosophy furnishes no satisfying evidence of the separate existence of the human soul, any more than of the animal or vegetable life. But, on the contrary, according to Aristotle's rule, whatever *energizes*, or operates only with body, cannot exist without body; for he did not conceive that *energy* and *existence* could be separated. I therefore say, that Mr Locke, by confounding ideas and sensations, has laid the foundation, though, I believe, without intending it, of all the Atheistical philosophy since his time: And, accordingly, as I have observed, all those philosophers maintain that there is no such distinction.

There are other arguments, however, used by Philoponus, and other philosophers, both antient and modern, in support of the separate existence of the soul, which I would not chuse to give up, such as, that the soul does not grow old with the body, but is often in greatest vigour when the body is most decayed; and, that the soul sometimes consumes and destroys the body, which could not happen if it were, by its nature, substantially and necessarily united with the body. These, and such like arguments, have, no doubt, their weight; but, I confess I do not think there

found that Aristotle composed his celestial bodies of a fifth element, he imagined that he made the human soul, and the Divinity itself, of the same stuff; whereas, there is nothing more certain, than that Aristotle maintained the existence of immaterial substance; and asserted the human mind to be of that kind. And, as to the Divinity, the conclusion, both of his physics and metaphysics, is, that there is a Being, immaterial, eternal, unchangeable, the author of all motion, yet immoveable itself. But, as to Cicero, believing, as he did, that the soul was corporeal, it was no wonder that he could not conceive how it should have the power of seeing and contemplating itself, which is the faculty that, of all others, distinguishes the human soul the most from any thing material.

there are any of them which conclude so demonstratively as the one above stated.

The next thing to be considered concerning the human soul is, its *immortality*; as to which, Philoponus says, that no man who admitted it to be immaterial, and to have a separate existence, ever entertained any doubt. And, indeed, it is impossible that we can conceive any way in which it should be perishable of itself, that is, by its own nature, or otherwise, except by the immediate act of God; for death is truly what it is called, a dissolution; nor can we conceive any thing dying or perishing, except by a separation or discription of its parts, which cannot happen to an immaterial substance*; for the only way in which we can conceive any thing to be dissolved is, by the separation or disarrangement of its parts, or by its being joined with, or affected by any thing foreign to its nature. Now, neither of these two can happen to an immaterial soul, in a state of separation from the body: For, in that state, according to Aristotle, it cannot suffer; all its sufferings, from passions, such as fear, anger, grief, according to him, arising from the body†; the *terreni artus moribundaque membra*, as Virgil calls them;

Hinc

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* This is Cicero's argument for the immortality of the soul: For, having laid it down, that nihil animis admixtum, nihil concretum, nihil copulatum, nihil coagmentatum, nihil duplex; he adds, quod cum ita sit, certe nec secerni, nec dividi, nec discerni, nec distrahi potest, nec interire igitur. Est enim interitus quasi dissensus et secretio et direptus earum partium quae ante interitum junctione aliqua tenebantur; *Tusculan Questions*, lib. 1. cap. 29.—And certainly we have no conception of any species of corporeal thing perishing in any other way.

† Lib. 1. *De Anima*, Cap. 5. where he says, that *νοῦς* is *ῥησιμον* τὴ καὶ *ἀπαθής*—where he likewise says, that there is no motion in the mind, but that the motion of the body sometimes reaches to it, and sometimes proceeds from it, *ἢ ἐκείνη (τῇ ψυχῇ) τῆς κινήσεως μὴ οὕτως, ἀλλ' ὅτε μὲν μέχρις ἐκείνης, ὅτε δὲ ἀπ' ἐκείνης.*

Hinc metuunt, cupiuntque, dolent, gaudentque; nec auras
Respiciunt, clausae tenebris et carcere caeco.

I will add a demonstration of the immortality of mind, taken from Plato, the rather, that it is founded upon the definition which I have given of *mind*, and which, as I have shown, is the same with Plato's definition, viz. that it is what *moves*, whereas body is what *is moved*. Whatever, says he, is moved by any thing else, may cease to *be moved*; and then it ceases to live, or to be animated: And this is the case of *body*. But *mind* has a principle of motion in itself, and is, by its nature, *self-active*. Therefore it can never cease to move and to act, since it cannot depart from itself, nor renounce its own nature.—Further, as it is the principle of movement diffused all over the universe, it can have no beginning; for all things arise from a principle; but a principle has itself no beginning or origin: And, as it had no beginning, so it can have no end; for, if it were to end, the heavens, and all nature must stand still, nor could they be again set in movement*.

Thus,

* The passage of Plato is in the *Phaedrus*, p. 1221. edit. Ficini. and I will give the reader Cicero's translation of it, together with his observations upon it—Quod semper movetur, id aeternum est. Quod autem motum affert alicui, quodque ipsum agitur aliunde, quando finem habet motus, vivendi habeat necesse est. Solum igitur quod se ipsum movet, quia numquam deseritur a se, numquam ne moveri quidem desinit. Quinetiam caeteris quae moventur, hic fons, hoc principium est movendi. Principii autem nulla est origo; nam ex principio oriuntur omnia: Ipsum autem nulla ex re alia nasci potest: Nec enim esset principium quod gigneretur aliunde. Quod si nunquam oritur, ne occidit quidem unquam. Nam principium extinctum, nec ipsum ab alio renascetur, nec a se aliud creabit; siquidem necesse est a principio oriri omnia. Ita fit, ut motus principium ex eo sit, quod ipsum a se movetur. Id autem nec nasci potest, nec mori: Vel concidat omne coelum, omnisque natura consistat, necesse est, nec vim ullam nanciscatur qua ut primo impulsu moveatur. Cum pateat igitur aeternum id esse quod se ipsum moveat, quis est qui hanc naturam animis esse tributam neget?

Thus, I think, I have proved, by arguments, both *a priori* and *posteriori*, that *mind*, or the *moving* principle in all bodies, is immaterial ;

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neget? Inanimum est enim omne, quod pulsu agitur externo. Quod autem est animal, id motu ciatur interiore, et suo. Nam haec est propria natura animi atque vis. Quae, si est una ex omnibus quae seipsum semper moveat: Neque nata certe est, et aeterna est.—And Cicero's observation is in these words: 'Licet concurrant plures omnes philosophi (sic enim ii, qui a Platone et Socrate et ab ea familia dissident, appellari videntur) non modo nihil unquam tam eleganter explicabunt, sed ne hoc quidem ipsum quam subtiliter conclusum sit, intelligent. Sentit igitur animus se moveri; quod cum sentit, illud una sentit, se vi suâ, non aliena, moveri: Nec accideret posse, ut ipse unquam a se deferatur. Ex quo efficitur aeternitas: Nisi quid habes ad haec.' *Tusculan Questions*, lib. 1. cap. 23. This is all that could be expected from a philosopher who professed to believe, that nothing was certain, but only some things more probable than others.

It may be observed, that Plato, in this passage, has fallen into that inaccuracy of expression, which I took notice of before, page 78. for which he is severely reprehended by his scholar Aristotle, (*Cap. 3. lib. 1. de Anima*), in saying, that the mind is *νοητικόν*, which Cicero has translated *quod se ipsum movet*; for, whatever moves itself, must be moved, and what is moved must be body, which certainly Plato did not believe the mind to be. But the argument is equally conclusive, if we understand, as Plato no doubt meant it, that *the mind is a moving Principle, and is self-active*, that is, *active by its nature and essence, without being acted upon, or impelled to action by any other thing*. In short, Plato's opinion was the same with Aristotle's, in this matter, as in other things, where they have expressed themselves differently, that *energy*, or *action*, is of the very essence of mind. And indeed, I think it is impossible to conceive mind existing without energizing: And if it could exist so, but for a moment, there could be nothing in the nature of things to hinder it from existing so to all eternity, that is, it would be of a nature mortal and perishing. It is, therefore, true, what Aristotle says in a passage that I have quoted above (p. 141.) that the mind, *νοῦς ὅτε μὴ γινώσκει ὅτε δὲ οὐ γινώσκει*. So that, though we do not always recollect our thoughts, not when we are waking, any more than when we are sleeping, we may be sure that the mind is always thinking.

rial;—that the human soul is not only immaterial, but has a separate existence, and also, that it is immortal. There are other observations to be made upon this important article of *mind*; but these will be the subject of some other chapters.

CHAP.

C H A P. XVII.

Of the Difference of the several Kinds of Minds—The first Kind that which moves unorganized Bodies—Several Motions produced by it.—Gravitation—Attraction—Repulsion—Circular Motion—The Principle of these Motions internal—Comparisons of these Principles of Motion with Intellect, and with one another—They all act without Consciousness, Intelligence, End proposed, Deliberation, or Intention—Definition of Nature—Difference betwixt the Vegetable and the Principle of Motion in unorganized Bodies—Difference betwixt the Vegetable and Animal—Definition of the Animal Nature, and of Instinct—Reason why Instinct never errs—Cudworth's Plastic Nature the same with Aristotle's Nature—Nature supposes a God—Only from the Study of the Human Mind that we can form any Conception of God—This Study the Foundation of Theism—The Philosophy of Mind only to be learned from the Books of the Antients.

HAVING said so much of *mind* in general, and the *human mind* in particular, I will, in this chapter, explain more particularly the difference that I apprehend there is betwixt the several minds I have mentioned, beginning with the lowest kind, but which is absolutely necessary for carrying on the business of nature, and even for the existence of a material world.

And, *first*, this so powerful principle is that which unites and keeps together all the several bodies ; in so much that, without it, there would be no such thing as *body* in the universe. It is therefore the principle of *union* in body ; and, as it is only mind that unites, or is
active

active in any way, it is for that reason, I think, if there were no other, to be classed under *mind*. It is by it that bodies are discriminated from one another, and receive different appellations, such as *earth, stone, wood, &c.*; for, without this principle, nothing could be called any thing, but all things would be mixed with all, according to the philosophy of Anaxagoras.

Secondly, It is this principle which gives the several motions to body, by which it may be said to live, and to be animated. Of these motions Aristotle has made a general division, and which I think full and compleat, into such as are in a straight line, such as are in a curve revolving into itself, and such as are mixed of these two; or, as I would rather chuse to express it, are neither the one nor the other. But I will divide them more particularly, beginning with those that are in a straight line.

And, *first*, there is that motion well known under the name of *gravitation*, by which bodies here below tend towards the centre of the earth. This motion, as I have observed, cannot be accounted for from any material impulse. It cannot be, as I think I have demonstrated, the matter itself which moves itself; and, therefore, it only remains, that it must be produced by *mind*. And, indeed, as gravitation does not operate in proportion to the surface of bodies, but to their mass or solid contents, it is impossible to conceive how it should be produced by any *material power*, as matter acts only upon the surface of matter*. The only question, then, is, Whether it be mind operating externally upon the body, or internally, that is, residing in the body, and animating it? And I find that appears to have been a doubt concerning the motion of the celestial bodies in the days of Plato; for, though all the philosophers of those days, who were

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* See this argument very well enforced by Dr Clarke, in his *Demonstration of the Being and Attributes of God*, p. 83.

not Atheists, believed the motion of these bodies to be carried on by mind, some appear to have thought, that it was by mind externally operating upon them, and, as it were, pushing them on, while others thought that it was *mind internal* animating them, and moving them, as our minds move our bodies *. And, among the modern philosophers, I find one that has written an excellent book upon the human soul, viz. Mr Baxter, who ascribes this motion of gravitation, as well as every other natural motion of body, to the immediate agency of the Deity. But, though I am sorry to differ from an author whom I think the most perfect Theist of any that has written in this century, I cannot help thinking it more agreeable to the analogy of nature, that the motive principles of these bodies should be internal. It is so undoubtedly in our bodies; and every philosopher, in Britain at least, believes it to be so likewise in the bodies of the brutes. Neither do I see that there is any good reason for stopping at the vegetable, betwixt which and the brutes there is no other difference but what sensation and progressive motion make. Thus far Aristotle, and all the antients who were not Atheists, have clearly gone. And, further, Aristotle lays it down as the foundation of his natural philosophy, that there is an *internal* principle of motion in all physical bodies, though he does not call it by the name of $\psi\chi\eta$, or *mind*; and only says it is *like a mind*. But Plato is more explicit upon this subject; for, he says expressly, in the passage quoted in the beginning of this work †, that it is *mind* that *moves*, and *body* that *is moved*. And the later Platonists, and particularly Proclus, is still more explicit upon

* Plato, in the 10th Book of Laws, (p. 954. edit. Ficini,) proposes three opinions upon this subject. Two of them are those mentioned in the text; the third is, that *mind* external to the celestial body did not immediately move it, and push it on, but did it by the intervention of another body of fire or air, which it assumed to itself, and so moved body by body.

† P. 9.

upon this subject; for he blames Aristotle for animating the celestial spheres, and putting them under the direction and superintendency of *mind*, but leaving all the lower elements dead and inanimate*. And this appears to be likewise the opinion of the most antient philosopher of Greece, Thales; and I doubt not, but that he brought it from Egypt with him; for he said that the whole universe was full of gods, that is, of *minds*; and, particularly, he said, that it was *mind* in the loadstone which attracted iron.

And, I think, this hypothesis of mine is agreeable, not only to antient philosophy, but to religion; for our scripture tells us, that the Deity, in his intercourse with men, employs subaltern minds or angels, as they are called, to execute his will. And I see no reason why we may not suppose, that, by the same ministry, he carries on the operations of nature: And, I think, it gives a much higher idea of the Supreme Mind, than if we were to suppose him performing all natural operations, such as the formation of plants and animals in their successive generations, and the movement of every the least body, or concretion of matter, by his own immediate agency, and, as it were by his own hand†. If it be true, as I suppose, that there is as great a variety of minds in the universe as of bodies, it is evident, that, if all the business of nature was to be the immediate work of the Supreme Mind, those inferior minds which, as I suppose, descend below the Supreme, in infinite gradation, and, in that way, fill up the scale of nature, would want employment, and 'be useless for any thing that appears in 'the creation'.—Further, the progress in the generation, as well as the corruption of all things here below, is very slow, nature proceeding step by step, from one state of the thing to another. Now, it seems
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* Proclus in *Timæum*, p. 286. et 287. See also Cudworth's *Intellectual System*, p. 236. 237.

† See the book *de Mundo*, ascribed to Aristotle, cap. 7.—See also Cudworth's *Intellectual System*, p. 149. where this matter is very well treated.

more worthy of the Divine Majesty, that this operose process should be gone thro' by inferior agents of limited power, to whom it is prescribed to act only in a certain way, than that it should be the immediate work of Omnipotence, who could do the work all at once, and by a *flat*, without going so much round about.—And, *lastly*, this hypothesis will account for Nature sometimes being disappointed of her end, and making what we may call *imperfect* and *bungling work*. This may happen through the inaptitude or stubbornness of the *matter* not yielding to the force of an inferior operator; but could never happen, if the agent were omnipotent.

This reasoning, if it be good, will apply to all the other natural movements which I am now to mention. The next of the rectilinear kind, that I shall take notice of, is the movement of fire or flame, which is the opposite of the movement of gravitation; for it is *downward*, or towards the centre of the earth; whereas the movement of fire is *upwards*, or from the centre. I know there are some who think that flame ascends in the air in the same way that any lighter body rises in a heavier fluid; but it is to me evident, that the motion of flame is quite different from that of lighter bodies which we see in the air, such as dust and feathers: For they only float in the air; whereas flame springs up in a spire, with a force and impetuosity, which cannot be ascribed to the air in which it moves, but to some innate and instinctive principle of movement in the body itself. And, if there could be any doubt that the ascent of fire was natural to that element, there are other movements of bodies upwards, which cannot be accounted for from any adventitious or mechanical cause; such is the motion of the juices of a tree upwards from the root, through the trunk, to the branches. And the vegetable affords another instance of this motion, still more obvious to the sense: For, take a plant in a flower-pot, and reverse the flower-pot so that the head of the plant shall be down, keeping the earth still in the flower-

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pot,

pot, the stem of the plant will nevertheless bend itself, and grow upward, even though a weight be appended to keep it down. It appears, therefore, to be certain, that there is in nature a motion upward as well as downward; such as cannot be accounted for from any material impulse, or mechanical cause, of any kind.

The third rectilineal motion I shall mention is, that by which bodies move toward one another. This, as well as gravitation, or the motion of bodies to a centre, is called, in the language of our modern philosophy, *attraction*; a very improper name for it, as I shall take occasion afterwards to observe. It is a motion unknown to Aristotle, and to all the antient philosophers, as far as I know; but, by later experiments, it is certainly known to exist in nature. And chemistry, particularly, exhibits to us wonderful examples of it; from which it appears, that bodies, by this movement, sometimes unite themselves to one kind of body, and then, finding another that they like better, they go to that other, and incorporate themselves with it. This is what is called, in chemical language, *elective attraction*, by which the particles of matter appear to chuse and prefer one kind of body to another. And, indeed, in such kinds of movement, *mind* is, I think, visible, even to the most vulgar and ignorant.

This kind of movement appears to me to be the principle of cohesion in bodies, by which all the different kinds of natural bodies are formed and discriminated one from another. The effect of this principle is most visible in the common chemical experiment of the solution of salts of different kinds in water; for, when the water is evaporated, all the several particles of the different salts range themselves, as it were, under their proper standards, and unite to form crystals of the several kinds. And, in this manner, I imagine the homogeneous particles of all the different bodies in the universe have united to form those bodies.

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The *fourth* kind of rectilinear motion, and which appears also to have been unknown to the antients, but is now universally acknowledged, is the opposite of what is called *attraction*, and therefore is denoted by the name of *repulsion**; by which bodies, instead of moving towards one another, move a contrary way, and, as it were, fly from one another. What the influence of this principle of nature is, and whether it be as universal as the influence of the other principle last mentioned, is not, I believe, well known; but I am told that there is a philosopher now in Geneva, *Le Sage*, I think, is his name, who is writing a book to prove, that all the phaenomena of nature, which Sir Isaac Newton has explained by *attraction*, may be as well or better explained by *repulsion*.

These are all the rectilinear motions which are constant and uniform in nature. The next kind of motion mentioned by Aristotle is the *circular* motion, which he ascribes to the celestial bodies, and which he no doubt supposed to be exactly *circular*, but which, by later discoveries, is found to be *elliptical*. It is, however, true, that it is a motion of the circular kind, in so far as it revolves into itself. And I believe it is likewise true, as Aristotle supposes, that it is peculiar to the celestial bodies: At least, we have not hitherto discovered any other bodies that move regularly and constantly in such a line.

The *last* kind of motion that Aristotle mentions, is what is betwixt the other two, that is, what is neither in a straight line,

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* As both attraction and repulsion seem to have been unknown to the antients, there is one division of simple or uncompounded motion made by Aristotle, which is not complete. That motion, says he, is either *to a centre*, *from a centre*, or *round a centre*; *Lib. 1. de Coelo, cap. 2.* For that motion, by which bodies attract or repel one another, is a simple rectilinear motion, but none of these three.

nor in a circular, but in a curve, which is neither the one nor the other.

This mixed kind of motion is to be observed chiefly in animals, though they also, upon occasions, move either in straight lines or in circles; and the reason of this variety of motions in them is plain, namely, that their mind, or moving principle, directs them to move different ways, as the exigencies of their nature require. Whether there be of this mixed motion in the vegetable and mineral kingdoms, or only the simple motions of *up* and *down*, *to* and *from*, I believe we have not yet experience sufficient to determine.

Man is not only moved by that principle of motion, which is commonly known by the name of *animal life*, but by a higher principle, which I call *intellect*: But Aristotle's division is so comprehensive, as to take in that motion, and, indeed, every motion that can be conceived.

Of intellect I have said a great deal, and shall say something more in the end of this chapter; but, in the mean time, I will proceed to explain, still more particularly, the operations of the principle of motion in unorganized bodies, in vegetables, and animals, by comparing them with one another, and with the operations of intellect in man. And, in the *first* place, I will consider in what the three first principles I have mentioned agree, and in what they differ from the operations of the intellect; and, in the *next* place, I will consider in what they differ among themselves, and what each has particular and peculiar to itself.

And, in the *first* place, they all agree in this, that the moving principle has no *consciousness*, by which, I mean, that it does not review
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its own operations, and make itself its object; or, in one word, *reflect*: For this I hold to be the proper meaning of the term *consciousness*; which I am not surpris'd to see mistaken by Mr Locke, and the French philosophers *: But, I confess, I am surpris'd to find so accurate a metaphysician as Doctor Clarke confounding *perception* and *consciousness*, which he does through his whole book of the Demonstration of the Being and Attributes of God †; and, for want of making the proper distinction betwixt the two, he has said nothing, when his argument required that he should have said a great deal, of that prime faculty of the human *intellect*,
by

* See what I have said upon this subject in the first volume of the Origin and Progress of Language, 2d edition, p. 155.

† See Demonstration of the Being and Attributes of God, p. 54. and 57. 4th edit. where it is plain, that the Doctor uses *thought*, *intelligence*, *consciousness*, *perception*, and *knowledge*, as synonymous terms. Nay, he has confounded the *motive power*, or principle of motion, with *intelligence*. In consequence of which, he has given us a proof of intelligence in the Deity which is altogether inconclusive. The Deity, says he, must be intelligent, because he is the author of motion; p. 61. Now, if the Doctor had distinguished, as the antient Greek philosophers do, betwixt *Νους* and *ψυχη*, he would have known, that motion cannot indeed be produced without *ψυχη*, or *mind*, as I translate it, but may be produced without *Νους*, or *intelligence*; and, in fact, it is so produced, both in brute animals and vegetables, which no man, who knows what he says, will say, have intelligence or consciousness. But the Doctor, though he was a very acute metaphysician, learned too in the New Philosophy, and, at the same time, an excellent Greek and Latin scholar, did not apply his Greek learning sufficiently to what I think is its best use—the study of Greek philosophy. If he had done that, he would have learned to have made the distinction above mentioned betwixt *ψυχη* and *Νους*, that is, betwixt *mind* that only *moves*, and *mind* that likewise *understands*. And his conclusion from the Deity's being the author of motion, would only have been, that the Deity was *mind*, and not *matter*; but he ought not to have concluded, as he has done, that he was an Intelligent Being. And, in general, I cannot help observing, that, however learned we may be in the philosophy of *body* by the study of modern books, yet, without the knowledge of the antient philosophy, we are miserably defective in the philosophy of *mind*, as I could shew, by many other examples, from modern books of philosophy, if it were not an invidious and ungracious task, to expose the errors of authors who have otherwise a great deal of merit.

by which, more than by any thing else, we are distinguished from the brute, and our mind removed at the greatest distance from every thing material; for it is by *consciousness* that a being is attentive to itself, is present, as it were, with itself, perceives itself, and has enjoyment of itself. In short, it is that faculty, by which we come the nearest to our idea of Divinity *. If there were no distinction betwixt it and perception, then would the brutes be *conscious* as well as we. Now, I hold it to be certain that they are not; and, therefore, I have set down *want of consciousness* as common to all the natural moving principles above mentioned.

These natural *motive powers*, not only have not this prime faculty of *intellect*, but they have not *intellect* at all; for they do not contemplate the nature of things, apprehend generals, or form ideas. They act, therefore, without intelligence or design, not having any idea of the end for which they act: For this reason, they are to be considered 'As *manual opificers*, that act subserviently under the *architectonical* art and wisdom of the Divine Understanding,' as Cudworth has very well expressed it †. Though, therefore, they work regularly, orderly, artificially, and to a certain end, yet they do not intend that end, or understand the reason of what they do. And, if it

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* See, on this subject, Cudworth's Intellectual System, p. 159.

† Intellectual System, p. 156 —The thought is not his, but he has taken it from Aristotle, in the beginning of his Metaphysics, whom he has quoted. He has also quoted a passage from Plotinus, which shows, I think, as much as any, the depth of the understanding of that philosopher. He says, that nature is the last of *mind*, being no more than an obscure image or imitation of Divine Wisdom; as when, says he, we make a deep impression with a seal upon a thick piece of wax, the stamp or signature, on that side which we impress, will be strong and clear, but, on the other side, weak and faint. And from thence, he adds, it comes, that nature does not know, but only acts, *ὅτι οὐκ οἶδεν φέρειν, μόνον δὲ ποιεῖν*. This, I think, is a most apt similitude, illustrating my notion of the progress of *mind* downward from the highest mind, to that which acts in natural things, without intelligence, or knowledge of what it does.

were otherwise, and that the brute and vegetable, not to speak of unorganized natures, could be supposed to propose to themselves the ends of their actions, and to devise means for accomplishing those ends; in short, if they could be supposed to operate as human art does, they would have infinitely more intelligence than any human artist; for no art of man can produce works of such wonderful contrivance as those of nature. But the Wisdom that directs those works is as much superior to human wisdom as the works are to human works.

310. Those moving principles act without consultation or deliberation, as well as without consciousness or intelligence. This is undoubtedly true of the vegetable, and of the motive principle in unorganized bodies. But, as the better sort of animals come near to human nature, they, as I have already observed *, deliberate upon particular occasions; but it is not such a deliberation as the human; for they do not deliberate concerning ends and purposes, or upon general notions of what is *good* or *ill*; but all their deliberations are concerning particulars, as, whether they shall yield to one particular instinctive impulse in preference to another. And, as to the works of some brutes, so wonderfully artificial, which the students of nature admire so much, such as the cells of bees, the webs of the spider, the nests of some birds,—they perform them neither by *art*, as Aristotle says, nor with inquiry or deliberation †: And he ridicules those who think that nature acts for no end, because they do not see the motive principle consulting and deliberating; and he adds, very properly, ‘for even *art* does not deliberate ‡.’ And, if it be true, that even human art, when it is perfect, does not search, consult, or deliberate, but

* Page 101—138.

† ‘Ουτε τεχνη ουτε ζητησις ουτε βουλευσις ποιει.

‡ αποποιει το μη οισθαι ὅτια του γινεσθαι, και μη ιδωσι το ποιουν βουλευσμενον ακιτος και η τεχνη ου βουλευεται. *Phyf. B. 2. c. 8.*

but acts readily and easily ; how much more should Divine Wisdom, that directs nature, act without consulting or hesitating ?

If any one is difficulted to conceive how any thing should be done regularly and artificially, without counsel or design in that which does it, let him study himself diligently, and he will find examples sufficient of that in his own *little world*. What a deal of wonderful work is going on within us, by which the blood circulates, concoction, digestion, secretion, and many other chemical processes are performed, without our knowing any thing of the matter, all carried on by a principle not intelligent, nor conscious of what it does, yet working most artificially to a certain end. Even the works of human art we very frequently perform without art, that is, without attending to the rules of the art, which many of us have never learned. Thus to read, to speak, to sing, or to play upon any musical instrument, are certainly works of art, which we learn with great trouble and pains ; yet the energies of these arts we perform without attending to the art, and often without any consciousness, or knowing what we are doing. This is the effect of custom or habit, which is said to be a second nature in man* : and, indeed, it may be said to be his first and original nature ; for, as I have elsewhere observed, the nature of man is such, that he, by use and custom, acquires many faculties that other animals have from nature. *Habit*, therefore, in man is what *nature* is in other things ; and if we see men, from mere habit, performing most artificial things, we ought not to wonder that nature does the same. And, in human society, we may observe something like this of nature ; for *there* it is absolutely necessary, that, by far the greater part of mankind should act in that way ; very few of the species having that architectonical knowledge mentioned above, or being qualified to act with intelligence, and the certain knowledge of ends : And yet

* Origin and Progress of Language, vol. 1. p. 24. 2d edit.

yet these are the only persons that are fit to govern either themselves or others. Under them, therefore, the rest of mankind must act like masons or brick-layers under the direction of an architect, without knowing for what purpose they act, yet acting orderly and artificially.

What makes us so much surpris'd at the artifice of *nature*, is our being so much accustomed to the works of human art, in which the art is always *external* to the matter upon which it operates; for the art is in the man, not in the wood, stone, or metal, which is only the subject of the art. But, in nature, the art is *internal*, being in the matter upon which it operates. This Aristotle very well illustrates, by supposing, that the wood of which the ship is made had in itself the ship-wright art; for then, says he, it would act just as nature acts *, that is, without knowing either the end for which it operates, or the nature of the means that it employs; for to know that, belongs to a higher principle, namely, the *Nous*, or *Intellect*, which, having the perfect knowledge of the *end* for which it acts, and of the relation of the means to that end, guides and directs this subordinate vital principle, which we call *nature*.

Lastly, Nature, as it acts without intelligence, so it acts without *will*, or *intention*; for *will* is the determination of intelligence to act. Of consequence, therefore, nature acts necessarily; for, where *will* is not, there *necessity* must be. And this *necessity* is truly what the antient philosophers called *fate*; for the Aphrodisian philosopher, the oldest commentator upon Aristotle, has rightly said, 'That *fate* is *nature*, and *nature fate* †.'

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Nature,

* Εἰ ἦν ἐν τῷ ξύλῳ ἡ ναυπηγικὴ, ὁμοίως αὖ τῇ φύσιν ἔπειτα. Phys lib. 2. cap. 8.

† Το τε ἱμαρμὸν κατὰ φύσιν, καὶ το κατὰ φύσιν ἱμαρμὸν. Alexand. Aphrodis. lib. de Fato.

Nature, therefore, 'is that mind, or principle of motion in body, which acts for a certain end or purpose, but without knowledge of that end, without consciousness, intelligence, deliberation, or intention, and fatally or necessarily.' And, in these properties, I have shown, that all the vital principles I have mentioned, that in unorganized bodized bodies, and that in organized, whether vegetable or animal, agree: And I am now to inquire into the difference betwixt them, and what each has peculiar to itself.

And, to begin with the motive principle in the vegetable, compared with that in the unorganized body: By the vital principle in the vegetable, it is nourished, grows, and propagates its kind; whereas the same principle in the unorganized body does no more than move it in a certain and determinate way, (for nothing in nature is undetermined or fortuitous.) The consequence of this difference necessarily is, that the movement of the latter is simple and uniform, either *up* or *down*, *to* or *from*, one another: Whereas the movements of the vegetable, by which such operations are performed, must needs be many and various. *2dly*, The principle of union, which, as I have said, is in all natural substances, and makes every one of them what it is, and nothing else, must needs be different in unorganized and vegetable substances: For, in the unorganized, it appears to be nothing else but the attraction and cohesion of homogeneous particles; whereas, in the vegetable, as well as in the animal, there is a certain nature by which the plant is preserved and kept together, and all the several parts of which it is composed are made to co-operate to the same end, viz. the growth, preservation, and propagation of the plant: And it is by this kind of mind or *genius*, as we may call it, of each particular plant, that the plant continues still the same, though every particle of its *matter* be changed.

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And here we have discovered a *mind* different from any of the motive powers of body above mentioned ; for these move only one body in a certain determined direction : Whereas the vital principle in the vegetable governs a *system* or *whole* ; for such undoubtedly the vegetable, as well as the animal, is. Now, where there is a *whole*, there must be some principle of union ; for it is not sufficient that there should be several principles operating separately, but there must be one which superintends the whole, directing and adjusting, as in this case, the several parts of the organic body of the vegetable, in such a manner, as to make them all conspire to the growth, nutrition, and propagation of the plant *. But we are not to suppose that this *genius* of the tree, this *Dryad* or *Hamadryad*, as the Poets call it, has intelligence, consciousness of what it does, or any knowledge of the end for which it acts, but, like the principle of motion in *matter* inanimate, acts merely as the inferior minister of that Superior Intellect which presides over the universe.

This is the difference betwixt the *vegetable* and *body unorganized* ; and I am now to explain the difference betwixt the *animal* and the *vegetable* : And in it is to be observed, that the animal contains in it two distinct natures ; one of the vegetable kind, by which it is nourished, grows, and propagates its kind, as the vegetable does. The mechanic structure of this part of the animal is much more various, complex, and artificial, than that of the vegetable. But the vital principle which directs and superintends this part of the animal oeconomy,

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* Cudworth, in his intellectual System, p. 164. expresses this in the following words : ‘ For the several parts of matter, distant one from another, acting alone by themselves, without any common directrix, being not able to confer together, nor communicate with each other, could never possibly conspire to make up one such uniform and orderly system or *compages* as the body of every animal is’—and he might have added, ‘ the *vegetable*.’

is no doubt of a kind analogous to that which presides in the vegetable, but more excellent, by how much it has a greater kingdom to govern.

As to the other part of the animal nature, and which, properly speaking, is the *animal*, it is very different from the vegetable, and comes much nearer to intellect: For it has *perception*, *appetites*, and *desires*, and what constitutes *pleasure* and *pain*. And it comes thus far still nearer intellect, that it may be said to have an end in its pursuits; For the brute, when he is hungry, proposes to eat, and of that food which is natural to him; and, in like manner, when he is in *lust*, his object is the *female* of his kind: But he has no end beyond the immediate object of his appetite; for he knows not that eating will nourish him, or that coition will propagate his kind.

The perception of the animal is by certain organs, which we call *organs of sense*. By these he has a communication with external objects, such as the vegetable has not: But of these external objects he forms no ideas, does not recognize his own mind, nor is conscious of any of its operations.—But, of the difference betwixt the animal and intellectual mind, I have said enough in a preceeding chapter*.

From this accout of the animal mind, it is evident that it must be much more perfect than that of the vegetable, because the oeconomy over which it presides is much more various and artificial; for, as the animal has different appetites and desires, these must be all so adjusted together, as to contribute to the end proposed by Nature, the preservation of the individual, and the continuation of the kind. Each of them, therefore, must be kept within its just bounds; and there must be a balance of the affections and passions, in their mind, as well as in ours. The selfish
passions,

* Chap. 10. lib. 2. p. 132.

passions, for example, must not go too far on the one side, nor the social and benevolent on the other, otherways disorder and misery would ensue *. This balance is kept even by what we call *instinct*, which is no other than 'Divine Wisdom directing the mind of the brute to that which is best, both for the animal itself, and for the kind.' And this mind, so directed, is the animal nature.

Here we may see evidently why *instinct* is said never to err; and why nature, according to Aristotle, whether it be considered in the animal, vegetable, or unorganized body, does nothing in vain, but every thing in the best way possible: So that, if we could discover, in every case, what is best, we should be sure, says Aristotle, that nature does it †.

When the animal or vegetable dies, then does the mind, which kept together the body, and conducted all its operations, forsake it; in consequence of which the body is dissolved, and the several parts, of which it was composed, return to the several elements from whence they were taken, viz. earth, air, fire, and water, and retain nothing but the elemental powers of motion, which are natural to all body, whether organized or unorganized. As to what becomes of the mind, and

* When I speak of the brute being *selfish*, we must not understand the word in the same sense as when we say, that a man is selfish; for a selfish man forms a system of self-interest, from which he excludes altogether, or neglects too much, the interest of his kind. But the brute forms no *system*, nor has any idea of a *whole* of any kind, but has different appetites and inclinations, some tending to preserve the individual, others the kind.

† *De Animalium incessu*, cap. 2. Where he repeats a maxim that he often inculcates, and which he appears to have considered as an axiom of natural philosophy, that 'Nature does nothing in vain.' 'Οτι η φύσις οὐδὲν ποιεῖ μάτην. And, in order to apply it to animals, which are the subject of this book, he adds, ἀλλ' αἰεὶ ἐκ τῶν ὀφειζομένων τῇ φύσει περὶ ἑαυτοῦ γίνεσθαι τὸ ἀρίστον (ποιεῖν); διότι καὶ βελτίον ἂν, οὕτως ἔχει καὶ κατὰ φύσιν.

and whether it exists after the dissolution of the body, I have said something in a preceeding chapter, and will say more in the second part of my work.

What I have said here concerning the animal and vegetable natures, agrees perfectly with Cudworth's doctrine of *Plastic Nature*, which, though it has been thought a peculiar fancy and conceit of this very learned divine, is in truth no other than the doctrine of Aristotle; for Cudworth's *Plastic Nature* is neither more nor less than what Aristotle calls simply *Nature*, or *φύσις*. This he has every where distinguished from *matter*, and has said, that it is a principle or cause much superior to *matter* *. And, in his admirable treatise, *De Partibus Animalium*, cap. 1. he distinguishes it from the matter, figure, colour, or any other property of the body of animals, and makes it to be the principle of all the order and regularity that we observe in the movements and operations of animals. It is true, that Aristotle, in this work, speaks of it as belonging only to animals; and Cudworth seems to think, that it extends no further than to animals or vegetables. But it is evident that Aristotle carried it to all physical bodies, unorganized as well as organized; for it is a fundamental principle in his natural philosophy, that all physical bodies have in them a principle of motion; which principle he calls by the same name of *nature*. And, in the books *De Coelo*, he has explained the different manners in which this principle moves different bodies. It is true, indeed, he has not dwelt so much upon the operations of this principle in the elemental bodies, as in the vegetable,

* 'Ἡ φύσις πολλὸν ἀρχὴ καὶ αἰτία τῆς ἕλης' *De Part. Animalium*, lib. 1. cap. 1. pag. 970. *Edit. Du Val*. And, in another passage in the same chapter, page 969. he says, that this principle, which he calls *φύσις ἵνα τοῦ τοῖσι πάντα*, that is, does every thing for some end. And he says elsewhere, that it works most artificially for this end, exceeding, by far, any thing of human art.

getable, animal, and celestial ; and, for this reason, is censured by Proclus, in a passage above quoted, as leaving the elements to move at random, without any mind directing them *. But, that he recognized the principle in those simple bodies, as well as the more artificial, is evident from many passages of his philosophical works ; and, indeed, it is an essential part of his system of natural philosophy. And every philosopher, who is not a materialist, and who believes that matter cannot move itself, must admit that all those bodies are moved by mind, either external, or internal, supreme, or subordinate.

Thus, I have endeavoured to distinguish the several minds which inform and animate nature, and produce the different movements that we observe in the material world, making three kinds or orders of them, rising one above another. The first, and lowest of them, is that which makes unorganized bodies cohere and move in different directions, but each kind of body only in one determined direction : A higher kind of mind is that which informs the *vegetable* ; and a higher still that which constitutes *sensitive* life, and directs the movements of the animal.

And here we may see the gross error of those philosophers, antient or modern, who make *Nature* their God, and would substitute, in place of the Supreme Intellect, this animating spirit which we see diffused through the whole universe ; for this spirit is so far from excluding intelligence from the government of the world, or making it unnecessary, that it manifestly supposes it : For, as Nature acts without intelligence, or knowledge of its end, yet works regularly and artificially, for attaining that end ; it is evident that there must be some higher power than nature, which proposes that end, and directs the operation of those natural agents towards it : And this Power is *God*. The Atheist, therefore, is reduced to the necessity, either of maintaining, that Nature does nothing for any end or purpose, which is contrary to common

* Page 208.

common observation and experience, as much as if a man should maintain, that a stone did not fall to the ground ; or, he must say, that an end may be proposed, and the best means contrived for accomplishing that end, without *intelligence* ; which is an absolute contradiction ; for *intelligence* in action is nothing else but proposing ends, and devising means.

It is most truly said in Scripture, that man is made after the image of God, by which we are to understand the *soul* or intellectual part of man ; for, to say that he resembles the Divinity in his sensitive or animal nature, would be highly profane and impious. But, by his intellect, he comes nearer to the Divinity than any thing we know ; and, therefore, as I have elsewhere said, it is only by the study of our own minds that we can come to know any thing of the Divinity, or of any Superior Mind : So that the precept of Antient Wisdom, which directs us to know ourselves, is not only an admirable moral precept of sovereign use in the conduct of life, but it is the foundation of the highest philosophy, and particularly that part of it which is called *theology*.

This prime faculty of man's nature is not bestowed upon him at once ; but, like almost every other thing belonging to him, is acquired by slow degrees, and, like other things in nature, has a regular progress. In this state of our existence, it is necessarily connected with the sensitive part of our nature, in so far as it is the senses which rouse it, as it were, to action, and furnish it the materials upon which to act. Of these materials it forms ideas in the manner I have described ; which ideas are the proper object of *intellect* : For, as particulars are the object of the *senses*, so generals are the object of *intellect*. The next operation of the intellect is, to compare these ideas thus formed, and to discover their agreement or disagreement : And this is the *discursus mentis*, or *reasoning*, as it is commonly called. The third great

great operation of intellect is that by which it is conscious of what it does, reviews its own operations, or, in one word, *reflects*. I call this the *great operation of intellect*, because, by it, it separates itself from all external things, and is conversant only with itself, enjoys itself, and, in this way, as I have observed, more than in any other, approaches to Divinity. And, lastly, by being conversant with ideas, the objects of intellect, and by studying diligently itself and its own nature, it comes at last to form the idea of *mind* and immaterial substance in general, and to form some notion of higher minds, and even of the Supreme Mind.

How we come to form this great idea, and arrive at the knowledge of that, which to know, is the completion of philosophy, and the perfection of human nature, belongs not to this part of my work to explain. I shall only here observe, that, without studying our own minds, it is impossible we can have any idea of the existence of such a Being; for it is only by that study that we can conceive what *council*, what *design* is,—what forming a plan, what proposing an end is, and what devising means for executing that end. That there is something within us which does so, we know, by the most certain of all knowledge, consciousness; and, that there is such an Intelligence in the universe, we know with as great certainty, as we know that there is intelligence in other men: For, how do we know that other men are intelligent? Is it not by their actions and their works, all bearing the plain marks of council and design? And, are there not the same, or infinitely greater marks of an Intelligent Being in the universe? Whoever requires stronger evidence than this, of the existence of such a Being, does not know what he would be at, nor what sort of evidence belongs to different truths. It is impossible that, by consciousness, he can know any thing but what passes within himself: And it is impossible that, by any reasoning *a priori*, he can discover any thing of the nature of God, but that he must have ex-

ifted from all eternity, and neceffarily and independently; and, further, that he muft be, by his nature and effence, immaterial. But what the particular nature of this Being is, whether he be wife or good, we can only difcover from his works, in the fame manner as we difcover thofe qualities in our fellow creatures. *The invifible things of God, fays the Apoftle, from the creation of the world, are clearly feen, being underftood by the things that are made**. To ask any other proof, is to ask a proof which the nature of the cafe will not admit; and, to attempt to give it, is to weaken the evidence of fo clear a truth.

Thus it is, that we proceed from *Nature* to God, through *man*. We firft difcover, in nature, a principle acting artificially for a certain end: And this principle we prove, by reasoning both *a priori* and *a posteriori*, to be immaterial. Then, by ftudying ourfelves, we find out, that there is, at leaft in our little bodies, a principle of counfel and wifdom, which forms defigns, and contrives means for executing thofe defigns. And, *laftly*, from as certain reasoning as the nature of the cafe will admit, we conclude, that there is fuch a principle in the univerfe. Thus we become perfect Theifts: But, for this, it is abfolutely neceffary that we fhould be learned in the philofophy of *mind*; for, without that knowledge, we fhall be apt to afcribe to body the qualities which only belong to mind, and reafon after the manner of certain philofophers, of whom I fhall, in the fequel, take notice. Whether the modern philofophy, fo much converfant with matter, will lead to this knowledge, or whether we muft not return again to the antients, and take them for our guides in this moft important ftudy, is fubmitted to the reader from what has been already faid, and will be further faid, in the courfe of this work. For my own part, I muft confeß, that it is from the antient books, and from them only,

that
 * Romans, i. 20.

that I have learned to know any thing of *mind* ; for they have taught me to distinguish betwixt sense and intellect, and to make a distinction still nicer, betwixt intellect and that reasoning faculty by which we compare the perceptions of sense, and which the brutes possess as well as we. Mr Locke, our great author for the philosophy of mind, has, not only, not made this last distinction, but has plainly confounded sense and intellect, sensations and ideas ; and, in this manner, has taken away, though, I believe, without intending it, the only solid ground upon which Theism can stand, and laid a foundation, upon which all the Atheistical writers, since that time, have built. And, indeed, if we believe that the human soul cannot *operate* without the body, there are no arguments in philosophy to convince us that it can *exist* without the body ; nor is it possible that we can have any just idea of superior mind, far less of the Supreme.

C H A P. XVIII.

The Doctrine of all Bodies being moved by an internal Active Principle, not new—maintained by Plato and Aristotle—also by Leibnitz, and other Authors—Difference of Minds admitted by every Body—The Vegetable Mind has something like Appetite and Inclination—The Mind in unorganized Bodies has something of the same Kind—The Belief, that there is no Principle in unorganized Body distinct from Matter, the Foundation of Atheism—Answer to the Objections, that this System multiplies Minds—that it makes all Nature to be a Wonder, and a Miracle—The Atheist is the greatest of all Believers—Vanity the great Source of Atheism—Cure proposed for this Vanity.

NOTWITHSTANDING the pains I have taken, in the preceeding chapter, to explain and support my system, I know very well, that by far the greatest part of my readers (if there be any that have accompanied me thus far) will think it very absurd and ridiculous, especially that part of it which gives *mind* to senseless and inanimate things, as they are commonly called. And it is so different from what is to be found in the books that are commonly read, that I am persuaded it will be thought a mere fancy and conceit of my own, such as never entered into the imagination of any before me.

That my system should be thought new, is not to be wondered at, in an age where the old philosophy is so much forgot, that it is no less new than when it was first introduced into the western parts of Europe, by the Greeks that came to Italy, after the taking of Constantinople by the Turks; for the language of this philosophy is lost in almost

almost all the nations of Europe ; and, tho' it be the particular honour of England, that it is better preserved, and more esteemed there than any where else, yet, I am afraid, the philosophy, to which it is the key, is but very little studied even in England. But, that the doctrine which I maintain, concerning a *mind*, or *internal motive principle* in *body* unorganized, as well as organized, is maintained both by Plato and Aristotle, I do positively aver ; and, therefore, this part of my philosophy is not new, however it may appear at present, but as old, I believe, as any philosophy in the world ; for it is very certain, that both Plato and Aristotle took their philosophy of *nature* from the school of Pythagoras. And it is as certain, that Pythagoras brought his philosophy from Egypt, the parent country of all arts and sciences *.

That

* Thales, the first philosopher of Greece, and who certainly learned his philosophy in Egypt, was among the number of those philosophers who thought, as I do, that *mind* was mixed with the whole body of the universe ; and, therefore, he said, ' That all was full of Gods.' Και η τῶ ὅλῳ δι τινος αὐτῆς (ψυχῆς) μιμνχθαι φασιν, ὅθεν ἰσως καὶ Θεὸς ἦν πᾶντα πληρῆ Θεῶν εἶναι ; Aristotle, *De Anima*, lib. 1. cap. 8. And Plato, in the *Epinomis*, uses the very same expression, as a saying of the philosophers before him ; for, says he, πνευματικὸς δι καὶ ἰκανὸς κινεῖται τὸ Θεῶν εἶναι πᾶντα πλὴν. And it was for this reason, no doubt, that Thales said, that the loadstone had in it a mind, because it moved iron, as Aristotle informs us, *Lib. 1. De Anima*, cap. 2. not conceiving how any thing could move another, except by the means of mind.

Aristotle, giving an account of the opinions of philosophers before his time, concerning mind, says, that they all agreed that mind was distinguished from body by two things, κίνησις τε, καὶ τῇ αἰσθανισθαι, by *movement* and *sensation*. Then proceeding to explain their opinions more particularly, he says, Φασὶν ἔνιοι καὶ μάλιστα καὶ πρῶτος ψυχὴν εἶναι τὸ κινεῖν. Some think that mind is chiefly and principally that which moves. But, says he, imagining that nothing could move another thing, but what was first moved itself, therefore they thought that *mind* was one of those things which were moved, as well as did move. Οἰοῦντες τὸ μὴ κινουμένον αὐτὸ, μὴ ὑδίσχεται κινεῖν ἑτέρον, τὸν κινουμένον τι τῇ ψυχῇ οὕτως ὑπὸ λαβόναι ; *Lib. 1. De Anima*, cap. 2. This was a gross material notion, which Aristotle has fully refuted in the next chapter of this book. It proceeded from observing, that body moved body only in that way. It was, however, a notion that Plato

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That Plato was a genuine Theist, and consequently believed that *body* did not move itself, but was moved by *mind*, is well known to those who know any thing at all of his philosophy. And it is evident, from the passage that I have quoted in the beginning of this work, that he made the same distinction betwixt body and mind which I do, making the one to be that which moves, the other that which is moved *. And, as to Aristotle, it is the foundation of his whole natural

gave too much countenance to, as I have elsewhere observed, by defining mind to be *that which was moved by itself*. In the same second chapter, he says, that all the philosophers agreed in defining mind by three things, motion, sensation, and immateriality: 'ὁρίζεται δὲ πάντες τὴν ψυχὴν τρεῖσι, ὡς ἵκανον κινεῖσθαι, αἰσθάνεσθαι, τὰ ἀσώματα. Now, immateriality, and the power of moving, is common to all minds; and, according to my opinion, is the definition of mind: So that the only error in the opinion of those philosophers was, in making sensation essential to *mind*; which is a notion rejected by Aristotle, who, through these whole books *De Anima*, speaks of the *vegetable*, as well as the *sensitive mind*, making it common both to vegetables and animals; and, particularly, in the end of the 9th chapter of the first book, he says, *οὕτως δὲ καὶ ἡ ἐν τοῖς φυτόις ἀρχὴ ψυχῆς τις ἴσως· μὲν γὰρ ταύτης καὶ αἰσθάνεται καὶ ζῷει καὶ φύεται*. But, whatever other things those antient philosophers added to the definition of mind, they all agreed in making the power of moving an essential property of it. In defining mind, therefore, in the comprehensive way I have done, I think I may venture to affirm, that I take in the opinion of all the philosophers of antiquity, who were not Atheists, and believed that there was a distinction between *mind* and *body*.

* The passage is in his 10th book of laws, page 951. *et sequen. edit. Ficini*, where he proves, that *mind* is more antient than body, and is the moving principle in the universe, while body is that which is moved. And he concludes the demonstration with these words: 'ἐκείνηται δὲ διδύκται ψυχὴ τῶν πάντων πρῶτον, ἡμεῖς δὲ τὴν ἀρχὴν κινήσεως. And, a little after, when he comes to speak of the motions of the heavenly bodies, he says, *ψυχὴ δὲ διοικουμένη καὶ ποικιλουμένη ἐν ἅπασιν τοῖς πάντι κινουμένοις μὴ οὐ καὶ τῶν οὐράνιων ἀστρον διοικουμένων φανταί*; where the learned reader may observe, that Plato, speaking of the *ψυχὴ*, uses not only the word *διοικουμένη*, but *ποικιλουμένη*; so that it is evident he believed the moving principle to be internal, and within the bodies, not external. It is therefore past all doubt, that what Aristotle calls *φύσις*, or *ἀρχὴ τῆς κινήσεως*, was, according to the philosophy of his master, *ψυχὴ*, or *mind*.

tural philosophy, that there is a principle in all bodies which moves them in some particular direction; for that principle is what he calls *nature*; and which, he says, is in all animals and plants, and likewise in the simple elemental bodies, such as fire, air, earth, and water: And, as this principle is undoubtedly *mind* in animals and plants, according to the notion of Aristotle, and all the philosophers of antiquity who were not Atheists, it follows necessarily, that this principle in the elemental bodies he mentions, must be the same, or of the same kind*.

Neither

* Aristotle's words are, (in the beginning of his 2d book of Physics,) *Τὸν οὖτως τὸ μὴ εἶναι φύσιν, τὰ δὲ δι' ἄλλας αἰτίας. φύσιν μὲν, τὰ τὴ ζῶν καὶ μένῃ αὐτῶν, καὶ τὰ φύτα καὶ τὰ ἄπλα τῶν σωματικῶν εἶναι γὰρ, καὶ πῦρ, καὶ ἀέρα, καὶ ὕδωρ· ταῦτα γὰρ εἶναι καὶ τὰ τοιαῦτα φύσιν φανερὸν.* And, in the 8th chap. of the same book, where he proves that nature does every thing for some end, he argues from the example of brute animals, such as spiders and ants, who undoubtedly work for a certain end or purpose: And he concludes the argument thus, *φανερὸν ὅτι οὕτως ἡ αἰτία ἢ τοιαῦτα ὡς τοῖς φύσιν γινόμεναι καὶ οὕτως.* 'It is evident, therefore, that such a cause or principle is in natural things.' Now, this cause is no other than what he calls *nature*, and has defined it to be a principle of movement in all physical bodies. Alexander Aphrodisiensis, therefore, the oldest commentator upon Aristotle, is certainly in the right, who says, that Aristotle, in his definition of *nature*, comprehends *mind*, as Simplicius informs us, in his Commentary upon this book of Aristotle, page 59. It is very true, that Aristotle, in his books *περὶ ψυχῆς*, appears to make a distinction betwixt *mind*, and this principle in unorganized bodies; for he there says, that it is only *συνεπὲς ψυχῆς*. But it is to be considered, that Aristotle, in his books *περὶ ψυχῆς*, treats only of the animal and vegetable life, and the rational soul; to which three only, as I before observed, (p. 8.) the word *ψυχή*, in its ordinary use, applies. It was, therefore, very natural for him to make a difference betwixt these minds in organized bodies, and that in unorganized; and there is no doubt a great difference, which I have endeavoured to explain. But they are only different specieses of the same genus, *mind*. And I think it is evident, from the passages above quoted, that Aristotle considered them as such; and, if those passages do not make it sufficiently clear, there is one in his first chapter *De Partibus Animalium*, page 969. edit. Du Val, which puts it out of all doubt; for he says there, that it is not the business of a natural philosopher to treat of all *mind*; for, says he, all *mind* is not *nature* but only one or

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Neither is this doctrine entirely antient; but it is supported likewise by modern authority. The first I shall alledge, is that of a philosopher of

more parts, that is, specieses of it. *οὐδε γὰρ πάντα ψυχὰ φύσις, ἀλλὰ τι μερὶον αὐτῆς, ἢ καὶ πᾶσι.* And, indeed, if we hold that the motive principle in unorganized bodies is immaterial, as well as that in organized bodies, which I think every man must do who believes in God, I would desire to know, by what other name we are to call that which is immaterial, if not by the name of *mind*; for all things existing are either *matter* or *mind*? Now, that Aristotle was a Theist, no body can doubt, who has studied his works with any attention; and, particularly, that he believed nature to be a principle of movement quite different from the matter which it moves, is evident from the whole system of his natural philosophy; so that it is unnecessary to prove it by particular passages; I shall, therefore, only quote one, which happens to be at present before me. It is in the first chapter of his incomparable work, *De Partibus Animalium*, p. 970. (*edit. Du Val*,) where, speaking of those natural philosophers that speak only of the *matter* of natural things, he says, that those philosophers know not what *nature* is; for, says he, nature is more a principle than *matter*. *αὐτὰ γὰρ ἢ φύσις μᾶλλον τῆς ὁλῆς.*

It is further to be observed, that Aristotle not only distinguishes the motive principle in organized bodies, from that in vegetables and animals, but all the three from *intellect*; which, from several passages I have quoted above, he makes to be a principle very different from what he calls *nature*; making the difference to consist chiefly in this, that intellect acts not only for a certain end and purpose, but with knowledge of that end, and with intention: Whereas nature acts, indeed, for an end, and most artificially, in order to attain that end, but blindly, and without knowledge or intention. But, because he makes this difference betwixt intellect and the mind of the animal or vegetable, does he therefore deny that intellect is *mind*? On the contrary, through the whole of his books *ὑψηλῶς*, he speaks of the intellect as a species of *mind*, but much higher and nobler than any of the other two; *ὑψηλότερον τῶν ἄλλων ψυχῶν.*

The truth, therefore, appears to be, that all the four kinds belong to the general idea of *mind*, but different very much one from another, in dignity and excellence. And, that he thought the principle, in organized or elemental bodies, internal, as well as the other principles, is evident from his whole *Physics*, particularly the first chapter of the 2d book, where he makes the distinction betwixt the works of art and the things of nature, to be, that the latter have a principle of movement in themselves; whereas

of great reputation upon the continent, and who, I really think, was a man of great genius, having done as much in philosophy as I think could well be done without the assistance of the antients; for he was so little of a scholar, that he had not even a language in which to express his philosophy. He holds, as I do, that there is no body at rest, but that all bodies are either actually in motion, or have a *nifus* towards motion; and that, therefore, his *monads*, which he makes the elemental principles of things, have all in them a principle of activity, in which, he says, there are, as it were, *perception* and *appetite*.

The passage is to be found (*Acta Erud. Lipsiae, Anno 1690, pag. 435.*) in a dissertation, where he disputes with one Sturmius, a German author; one of whose objections he answers in this way: ‘Re-
‘ sponderi commodè potest ex recepta non minus quam vera philoso-
‘ phia, materiam intelligi, vel secundam, vel primam: *Secundam* esse
‘ quidem substantiam completam, sed non mere passivam; *Primam*
‘ esse mere passivam, sed non esse completam substantiam, accidereque
‘ adeo debere animam vel formam animae analogam, five *επιτελεσμένην τὴν*
‘ *πρῶτην*, id est, *nifum* quendam seu vim agendi primitivam, quae ipse
‘ est lex insita decreto divino impressa. A qua sententia non puto
‘ abhorreere virum celebrem et ingeniosum, qui nuper defendit corpus
‘ constare ex materia et spiritu; modo sumatur spiritus non pro re in-
‘ telligente (ut alias solet,) sed pro anima vel forma animae analogà,
‘ nec pro simplici modificatione, sed pro constitutivo, substantiali, per-
‘ severante, quod *monadis* nomine appellare soleo, in quo est velut
‘ perceptio et appetitus.’ And a little after he says, ‘Arbitror ne-

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‘ que

whereas, the things of art, *εὐδαίμων ὁρμὴν ἔχει μεταβολῆς ἐμφοῦτον, ἢ δὲ συμβεβηκὴν αὐτοῖς*
λίθιναις, ἢ γηϊναῖς εἶναι, ἢ μικτοῖς ἐκ τούτων ἔχει κατὰ τούτου; that is, ‘The things of art
‘ have no principle of movement or change in themselves, or which is natural to
‘ them, except in so far as they happen to be made of earth or stone, or any thing
‘ mixed of these.’

‘que ordini, neque pulchritudini, rationive rerum esse consentaneum,
 ‘ut vitale aliquid seu immanenter (I suppose he means *indefinenter*)
 ‘agens fit in exigua tantum parte materiae, cum ad majorem perfec-
 ‘tionem pertineat, ut sit in omni; neque quicquam obstat, quo minus
 ‘ubique sint animae aut analogae saltem animabus; etsi dominantes
 ‘animae, atque adeo intelligentes, quales sunt humanae, ubique esse
 ‘non possint.’

Though the Latin be barbarous, yet I think the passage is intelligible; and the meaning is, that, in all body, which is what he calls the *secunda materia*, (in contradistinction to the *first matter*, without form or quality,) there is an active principle, which he calls *life*, or something analogous to life, and which, he says, has no intelligence, but constantly moves *body*, or gives it a tendency to motion: And this is what, in the language of his philosophy, he calls a *monad*. But it is nothing else than that principle of motion which Aristotle says is in all physical bodies, which I have called *mind*, and which Aristotle says is *ἡ πρώτη ψυχή*, or, *like to mind*.

The next modern author I shall quote is Doctor Cudworth, a most ingenious and learned writer, of whom I have made more use in composing this work, than of any other modern. He maintains, what is the foundation of my whole system, that body cannot move itself, and that, therefore, when we see body in motion, we are sure that the motion must have proceeded, at least originally, from some incorporeal cause *. And from his words, which I have quoted below, it is evident that he thought this a fundamental doctrine of Theism.

The

* Cudworth's Intellectual System, p. 888. His words are, ‘Since no body can possibly move itself, that which first moved *matter* must of necessity be incorporeal; nor

The last modern authority I shall alledge, is that of the greatest metaphysician, in my opinion, that ever was in England, to whom the cause of religion and morals is very much indebted; I mean Dr Clarke. He, in his discourses upon the evidence of natural and revealed religion, has told us, that, to maintain that God originally created a certain quantity of matter and motion, and left them to frame a world at adventures, without any determined or particular view, design, or direction, cannot be defended consistently, otherwise than by having recourse to downright Atheism. Then he goes on to say, 'That, seeing matter is utterly incapable of obeying any laws, the very original laws of motion themselves cannot continue to take place but by *something superior* to matter *continually* exerting on it a certain force or power, according to such certain and determinate laws.' And a little after he adds, 'That most universal principle of *gravitation* itself, the spring of almost all the great and regular inanimate motions in the world, answering (as I hinted in my former discourse,) not at all to the surface of bodies, (by which alone they can act one upon another), but entirely to their *solid contents*, cannot possibly be the result of any motion originally impressed on *matter*, but must of necessity be caused by something which pene-

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'trates

'nor could it move it by local motion, as any body moves another, or as engines and machines move, by trusion or pulsion, they being before moved, but must do it by another kind of action, such as is not local motion, nor *heterokinesie*, but *autokinesie*, that is, by *cogitation*. Wherefore that conceit of the Atheists, that an incorporeal Deity could not possibly move the *matter* of the world, because it would run thro' it, and could not fasten or lay hold thereupon, is absurd, because this moves matter not *mechanically*, but *vitally*, and by *cogitation* only. And, that a cogitative being, as such, hath a natural imperium over matter, and power of moving it, without any engines or machines, is unquestionably certain, even from our own souls, which move our bodies, and command them every way, merely by will and thought. And a perfect mind presiding over the matter of the whole world could much more irresistibly, and with infinitely more ease, move the whole corporeal universe, merely by will and cogitation, than we can our bodies.'

‘trates the very solid substance of all bodies, and continually puts forth in them a force or power entirely different from that by which matter acts on matter; which is, by the way, an evident demonstration, not only of the world’s being *made* originally by a Supreme Intelligent cause, but, moreover, that it depends every moment on some Superior Being, for the *preservation* of its frame; and that all the great motions in it are caused by some immaterial power, not having *originally* impressed a *certain quantity of motion* upon matter, but perpetually and actually exerting itself every moment, in every part of the world. Which *preserving* and *governing power*, whether it be immediately the power and action of the same Supreme Cause that created the world, or of some subordinate instruments appointed by him, to direct and preside respectively over certain parts thereof, does either way give us a very noble idea of *Providence* *.’ From these words, it is evident, that this great author believed it to be an essential part of the doctrine of Theism, that all the motions of the universe, and particularly the motion of gravitation, were not only begun, but continued and carried on, by an *immaterial* power, perpetually and actually exerting itself, not by a motion *originally* impressed upon *matter*, according to the doctrine of the modern Newtonians; and, further, that he thought it no absurdity to believe, that this immaterial power was not the Supreme Power that created the world, but subordinate instruments, appointed by him to direct and preside over certain parts thereof.

Thus, I think, I have shown, that my doctrine is no novelty, nor any crude notion of my own, obtruded upon the public. But it will be said, that it is not the less absurd for being supported by great authorities and great names; that it is contrary to common sense, as well as common language, to maintain, that inanimate bodies are animated.

And,

* Pag. 16. 17. and 18. edit. 4th.

And, indeed, those who have not learned from antient philosophy, to form a notion sufficiently comprehensive of body and mind, and who imagine that nothing is *mind* but what thinks, reasons, and reflects, will have no conception of mind in such bodies. But I would ask these gentlemen, first, Whether they do not believe that it is *mind* that moves their own bodies? To this, I suppose they will answer, That they do. Next, I ask them, What it is that moves the bodies of other animals? To this, I take it for granted, that the answer likewise will be, That this motive principle is also *mind*. Or, if they refuse to dignify it with the name of *mind*, they will allow, at least, that it is something distinct from their bodies, as much as the motive principle in us is distinct from our bodies. But this mind of the brute, or by whatever other name they chuse to call it, for I will quarrel with no man about words, they will, no doubt, allow to be different from our minds. Here, therefore, it is admitted, that there are two minds, both moving bodies, yet different from one another, and the one much more excellent than the other. But, how can we stop here, and not admit that the vegetable is likewise moved by *mind*, or some principle distinct from the body, by what name soever it be called? For the vegetable is an organized body, as well as the animal, and is nourished, grows, and propagates its kind, like the animal. It is true, indeed, it has not sensation, as the animal has; and it is confined to one spot of earth; whereas the animal is an emancipated son of the earth, as he is called by some author that I have read. It has not, therefore, the same variety of movements as the animal; but, such as they are, it is impossible to account for them from material or mechanical causes. And there is one of them that I have not yet mentioned, but which I think well worth observing: It is a movement of a plant growing in a dark corner of a cellar, by which it inclines itself towards the light that comes in at the window. This is a movement which shows a kind of inclination or appetite very much resembling that of the sensitive mind: So that, if we will make machines of plants,

we

we must, like the French philosophers, make machines also of the brutes.

Here, therefore, are three kinds of mind, the intellectual, the animal, and the vegetable, all moving body, but subordinate and inferior one to another ; so that, I think, it must be acknowledged, that there are different degrees of minds producing *motion*, and that it is not only the thinking and reasoning mind which does so. And, indeed, the only doubt seems to be, Whether the Superior Mind or Intellect be the immediate cause of the motion, though it certainly directs and superintends it, and therefore may be said to be the *primum mobile* ? or, Whether the motion be not immediately produced by an inferior mind, as there appears to be a progress in every part of nature, which does nothing by starts or bounds, but by all regular steps and transitions from one thing to another, though to us often imperceptible ?

The only question, therefore, is concerning the motions of the bodies called *inanimate*, betwixt which, and those of the vegetable, there is no difference, except that they are less various ; because the body which is moved is likewise less various, and of simpler texture : But they are as constant and regular, and have a tendency to a certain end and purpose, as well as those of the vegetable. And there are some of them, which, like those of the vegetable, seem to be directed by some kind of inclination or appetite, such as the motions of elective attraction above mentioned, where there appears not only appetite and inclination, but something of choice or preference of one thing to another.

I have insisted so much upon the mind, or principle of movement, in body unorganized, not only because I know it will be the chief objection made to my system, but because one of the principal sources of materialism and atheism, both in antient and modern times, appears to

to me to be the motions observed in those bodies, and particularly in modern times, when the experimental philosophy, as it is called, has made such curious and accurate observations upon those motions, and, by the means of glaffes, has discovered in the minute particles of matter such a wonderful variety of action, invisible to the naked eye. This philosophy, which is wholly conversant with *body*, has led some of these philosophers, that were not acquainted with a higher kind of philosophy, to believe that, as those motions could not be accounted for by any material impulse or external cause of any kind, they were essential to matter, and that it was of the nature and essence of certain bodies to move themselves in a certain way; and, as they observed, that those motions were all directed to certain ends and purposes, and that, by them, all the business of nature was performed, they concluded, that nothing more was necessary for the system of the universe, and that nature alone, operating as we see, by powers which they supposed to be innate, and essential to matter, might produce and preserve every thing in the universe, and the universe itself, without any mind or intelligence directing and presiding over the whole *. This is

* The first experimental philosophers in Europe were the chemists, such as Paracelsus, Van Helmont, and their followers. They appear to have been very differently affected, by observing the wonderful movements among the minute particles of matter; for, instead of being materialists, like some of our late experimental philosophers, they went to the other extreme, as was thought by many, who judged them to be no better than wild enthusiasts. They believed that the universe was full of mind and spiritual beings; for, otherwise, they thought there would be a void in the creation; and, particularly, that the earth, the air, the fire, and the water, were all animated by principles of life and motion, but without intelligence. These, they said, made all corporeal substances what they were, and gave life, action, essence, and existence, to all beings of that kind. The four elements, they said, served for bodies to these active principles, which they called *spiritual elements*; and, when the body was dissolved or corrupted, the spirit went away to animate another body; so that, according to them, the corruption of one thing was the generation of another. See the French *Encyclopédie*, under the article *Theosophes*, where their dogmas are stated at great length.

And,

is the philosophy of some late French writers, particularly the author of the *Système de la Nature*, who have systematised Atheism, and whose writings I therefore like better than those of a philosopher among ourselves, who has argued against all the principles of Theism, and, indeed, every principle of human knowledge, without endeavouring to establish any thing. And I like them better for another reason, that those authors acknowledge an end and purpose in the works of Nature, tho' she operates, as they say, not only blindly, and without any design or consciousness, but without any superior direction or superintendence; whereas the British author either did not perceive, or has not acknowledged, any end in the operations of Nature, but has defended Atheism, upon what, I think, the most absurd of all principles, that all things happen by chance, or by material and mechanical necessity, in the universe, and that nothing is done for any purpose or design*.

Now,

And, though they despised antient philosophy, and, indeed, did not understand it, yet it is surprising what a conformity there is betwixt many of their opinions, and those of Plato and Aristotle: Particularly, they maintained, that the celestial bodies were all animated. And I was surprised to find, among them, my notion, that there was in the microcosm, *man*, a trinity of principles, corresponding to the Trinity in the Great World.

* All Atheists, antient and modern, are agreed in this, that *body* or *matter* is the only thing existing in the universe, and that all things, even mind, reason, and intellect, are nothing else but various modifications of matter produced by its various movements. This is the fundamental principle of their system, in which they all agree; but they differ in this, that some of them maintain, that these movements of body are not regular, artificial, or for any end or purpose; but that bodies, being moved, did necessarily jostle and impel one another, and, by various conjunctions and disjunctions, and all the other effects which the concurrence of bodies must occasion, first produced, and still preserve this wonderful frame of things. This was the doctrine of Democritus, Leucippus, and Epicurus, and by far the greater part of the Atheists of antient times. But there was one Strato, a Peripatetic, and scholar of Theophrastus, who, not being able to account, upon this hypothesis, either for the move-

Now, if it be admitted to those philosophers, that the principle moving unorganized body, and in a certain direction too, and for a cer-

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movement of natural bodies, or for the order and regularity which he observed in nature, maintained, that there was in body a certain principle of activity, or a kind of life inherent in it, and essential to it, by which it was moved, and not at random, but in a methodical and artificial manner, and for a certain end and purpose. And, in this way, he accounted for the regular motion of the celestial bodies, the formation of plants and animals, their growth, nutrition, preservation, and propagation. But this principle, he said, had no intelligence or knowledge of the ends for which it operated, nor any consciousness of its own operations. See a more particular account of Strato's doctrine, given by Cudworth, in the third chapter of his first book. Of these two systems of Atheism, the first is the most absurd that it is possible to conceive. And I think there is nothing could have driven men to believe it, (if any did ever really believe it,) except that desperate abhorrence of mind, or incorporeal substance, and that doating madness upon matter, or the *Hylomania*, of which Cudworth speaks, (p. 135.); for, in the *first* place, it gives no account at all of the beginning of motion, as Aristotle informs us, (*Metaphysic. lib. 1. cap. 4. in fine.*) *2dly*, From motions begun, they do not say how, and carried on without any order or design, they account, not only for the formation of the celestial bodies, and of plants and animals here on earth, and for their first movements, but for the continuation of these movements, in the most regular and orderly manner, and for certain ends and purposes, and for the regular progression of plants and animals, from one state to another, till, at last, they arrive at the state proposed by nature. And, *lastly*, they give no account at all, how, from *matter*, or any of its movements, combinations, properties, or qualities, of any kind, could arise that thought and reason, which they were sure they possessed themselves, though there was none other in the universe. Yet this system, absurd as it is, is what our British philosopher has chosen to defend. On the other hand, the Stratonian system, or *Hylozoic*, as Cudworth chuses to call it, is in so far right, as it supposes a principle of activity in all matter, acting regularly for a certain end. And it is only erroneous, *first*, in supposing that this principle is material, and of the essence of matter: *Secondly*, That there is no principle of intelligence in the universe, under the direction and superintendency of which the active principle, in all matter, acts so regularly and artificially, without knowing for what purpose it acts. And thus, though they must have acknowledged that there was, in their little bodies, a certain principle of counsel and design, which proposed for its end the good of its particular system, yet they supposed that there was no such principle in the universe, but that every particle of matter was independent of another,

tain purpose, is essential to body, it will, I think, be difficult to stop there; and I do not at all wonder, that these gentlemen have proceeded, and made not only the vegetable, but the animal and intellectual natures, the production of mere matter and motion, as well as the rest of the universe; whereas, if I have succeeded in proving, that there is a principle of movement in all bodies, unorganized as well as organized, distinct from body itself, and of a nature and essence quite different; that this principle rises still higher and higher, till it comes to intellect, which not only acts for certain ends and purposes, but plans and contrives those ends and purposes, and is conscious of its own operations, I think I have struck at the very root of Atheism; for, if it be once admitted, that there is, in our little bodies, an immaterial principle which proposes ends, devises means to bring about those ends, which, in short, governs the actions of men, and directs the business of a great part of this lower world, the transition is easy and natural to minds still superior to ours, and with much greater powers and faculties, till at last we come to the Supreme Mind, by which the whole universe is guided and directed, and under which, what is called *Nature*, is no more than an inferior minister or operator.

It may be objected, that, allowing body cannot move itself, and, that all motion in the universe proceeds from the Deity, Why may we not suppose, that God has bestowed upon different kinds of bodies the power of moving in different directions, in order to carry on the business of nature? But, it will be said, there is no necessity to suppose that there is a mind in all bodies, and to confound the distinction betwixt bodies animate and inanimate.

To another, and acting by itself, without any reference to any thing else, so that there could be no general system of things in the universe. In short, this system of Atheism is nothing else but the *Nature* of Aristotle, and the *Plastic Nature*, or *Spermatic Principle*, of Cudworth, but without subordination to Deity. And this is a system which some late French writers have adopted.

To this I answer, that all the *powers* and *properties* of body, as well as *body* itself, do proceed, no doubt, from the First Cause, and Great Author of the universe; but, if he have bestowed upon body the power of moving itself, what is that but giving it a *mind*? for, how else shall we distinguish *mind* and *body*, except by *activity* and *passivity*, *mind* being that which, by its nature and essence, is *active*; *body*, on the other hand, essentially *passive*, and, therefore, only fit to be acted upon, not to act. Now, to move, is to *act*; and, therefore, if body be moved, and, if the motion proceed from an internal principle, that principle must be a *mind*, which it has pleased the Almighty to bestow upon it. What, therefore, is called a motion originally impressed by the Deity upon matter, is nothing else, when explained, but *mind* bestowed by God upon *matter*, and which operates continually in producing the motions of the universe; for, to suppose that such original impression could carry on the business of nature, without the continual exertion of an immaterial power, is, according to the opinion of Dr Clarke, in the passage above quoted *, inconsistent with the belief of a Providence, and a step towards Atheism.

It will be further said, that I make a wonder—a miracle of Nature—That I fill the world with spirits—That I want to bring back the antient mythology of Dryads and Hamadryads, Wood Nymphs, and Water Nymphs, and other invisible Genii, inhabiting the earth, air, and seas—or to revive the Sylphs and Gnomes of the Rosycrutians—In short, that my system is altogether visionary and enthusiastical.

To this I answer, that, as there is nothing else in nature, except mind and body, there is no absurdity in supposing, that there is as much of the one as of the other; for, since body is passive, mind active, and the whole system of nature is carried on by action and passion, it is only supposing, that, where-ever there is a patient, there is
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* Pages 235. 236.

likewise an agent. Even of the higher kind of mind, I mean the animal, we are sure there is in nature very great abundance. The larger and better sort of animals, indeed, are not to be found in so great numbers; nor is it fit they should: But the earth, air, and water, swarm with such prodigious numbers of the lesser animals, that I do not believe we have yet discovered half the number of the specieses of them. Besides those that are visible to the naked eye, glasses discover, as it were, a new world of them; for we find that there is no part of any animal or vegetable substance, dead or alive, in which we cannot discover, by the help of good microscopes, life and motion, in various forms and figures *. The vegetable life still abounds more, and multiplies much faster; for it appears to be a rule of Nature, that what is of an inferior kind abounds much more than what is more excellent; and, if so, it is not to be wondered, that the mere loco-motive life should abound much more than either the vegetable or animal. I would not, however, affirm, that even that life is infinite, and without bounds; for, though all matter be infinitely divisible in idea, I do not think there is any reason to believe that, in fact, it is so divided. That human art cannot so divide it, is evident; nor do I believe that Nature has done it; for Nature, as Aristotle says, abhors infinity †. And, if it be true that the universe is one compleat system, which, I think, every Theist ought to believe, it must necessarily be bounded by number and measure: For, where there is infinity, in the proper sense of the word, there can be no system; and, therefore, as undoubtedly there is a top of the pyramid, so there must be a basis of certain and definite dimensions. I hold, therefore, that the Newtonian philosophy, and the Epicurean of old, are in the right,

* Buffon's Nat. Hist.

† ὅτι οὐκ ἔστι φῦσις ἀπείρου τοῦ ἀπείρου. And he adds the reason, το μὲν γὰρ ἀπείρου ἀτλὺς, ἡ δὲ φύσις αἰεὶ ζῆται τέλος. 'What is infinite has no end; but Nature always aims at an end.'
De Gen. Animalium, lib. 1. cap. 1.

right, in supposing that there are bounds set by Nature to the division of matter, and that the elements of bodies are particles infinitely hard, and therefore indivisible; and which, from thence, are called *atoms*. Whether these atoms have any life and motion in them, or, whether the moving principle be given only to a certain collection or association of them, I cannot pretend to determine; but it is evident, that the loco-motive life can descend no lower than to *atoms*.

As to the *wonder* and *miracle* imputed to my system, it would, indeed, I think, be something miraculous, if I supposed that all the motions of this universe were produced by the immediate agency of the Supreme Mind. But as, on the contrary, I suppose that all the motions of the several bodies proceed immediately from inferior minds, I should be glad to know how that can be called miraculous. How, indeed, mind moves body, we cannot account: We may say, therefore, that, to us, it is wonderful. But, for that, we are not the less certain that it exists. And, as it is a fact of which we are daily conscious, it cannot, I think, be said to be even extraordinary. Further, that Nature should act regularly and artificially, for a certain end, without consciousness or intelligence, cannot appear either miraculous or extraordinary, as we know that we ourselves frequently do so*. *Lastly*, Neither can it appear extraordinary and miraculous, that there should be intelligence in the universe, when it is in our little bodies; or that, while the affairs of men are directed by counsel and design, the great work of Nature, so much more regular and artificial, should go on at random, without any wisdom, foresight, or direction.

It requires, therefore, I think, no extraordinary faith to believe in my system; whereas, the Materialists or Atheists, though they be commonly called unbelievers, appear to me to be the greatest believers of

* See above, page 216.

of any ; for, in the *first* place, they believe that matter moves itself, contrary to the clearest proof *a priori*, amounting even to demonstration, and contrary to the evidence of sense and common observation. And, *secondly*, They believe, not only that matter moves itself, but that it moves itself for a certain end ; and, for attaining that end, employs the most artificial means, not doing the thing at once, but proceeding, by regular steps, from one state of the thing to another, till, at last, it comes to that certain end ; and all this progress they suppose to be without any end proposed, or means contrived to execute that end. And, *lastly*, They believe, what I think as extraordinary a part of their creed as any, that there is no mind in the universe superior, or even equal, to the human mind ; for, whether it be the fortuitous concurrence of atoms, or blind *Nature*, operating without intention or design, that has produced this wonderful frame of things, it must appear very extraordinary, that, in all the infinite variety of nature, there should have happened to be produced but one intelligence, and that luckily should have fallen to our share *. And yet I think it is perfectly consistent with their system, not to admit any other intelligence, at least, none superior to the human ; for, otherwise, it would not be easy to determine where to stop, till they should come to the Supreme Intelligence : And I doubt it would be necessary for them to admit, that, as our intelligence governs and directs human affairs, so those higher intelligences govern and direct higher things, such as the business of *Nature*, and the administration of the universe.

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* The system of the antient Greek mythologists, who derived all things from those ancestors of nature, as Milton calls them, *Chaos* and *Night*, appears to me very much more reasonable than the system of our modern Materialists ; for those mythologists brought out of *Chaos*, not only the human mind, but all the Gods, that is, Superior Minds.

It is an observation as old as the days of Plato *, that vanity, and a fond conceit of wisdom and superior parts, is the great source of Atheism. And it is an observation that, I believe, will be found as true now as it was then ; at least, the believers of that kind that I have conversed

* The passage is in the 10th book of his *Laws*, in the beginning, where he says, That we are not to imagine that lust, intemperance, or violent passions of any kind, are the only cause of Atheism ; but what chiefly gives rise to it is, *αμαθια μαλα χαλεπη, δοκουσα ειναι μεγαλη φρωνησις*. ‘ A grievous ignorance, but appearing to itself the ‘ greatest wisdom.’ And, a little after, he calls Atheism *των παρα πολλοις δοξαζομενων ειναι σοφιστατων υπαντων λογων*. ‘ That which, to many, seems the wisest of all doctrines.’

The triumph of the Atheist over religion and popular prejudices, is finely described by Lucretius, in the praise he bestows upon his master Epicurus :

Quem nec fama Deum, nec fulmina, nec minitanti
Murmure compressit cœlum, sed eo magis acrem
Virtutem irritat animi, confringere ut arcta
Naturæ primus portarum claustra cupiret ;
Ergo vivida vis animi pervicit, et extra
Processit longe flammantia moenia mundi,
Atque omne immensum peragravit mente animoque:—

And again,

Quare religio pedibus subjecta vicissim
Obteritur, nos exaequat victoria coelo. Lib. I.

This philosophical pride, joined to the vanity of a French bel esprit, has produced such works as *Le système de la Nature*, *Traité sur l'Esprit*, *l'Homme Machine*, not to mention works of the same kind in our own country, which are as disgraceful to philosophy, as they are pernicious and hurtful to society, and an insult upon its laws. A scholar, however, and a man of taste, would read their works with some pleasure, as he does the poems of Lucretius, if it could be said of them, what Lucretius says very truly of himself, that

—Musæo contingit cuncta lepore.

But I will venture to affirm, that no man, who, by the study of the best monuments of the writing art, has learned to know what good writing is, will approve of the *style* of those writers, any more than of their *matter*.

conversed with, were remarkably vain, assuming to themselves a very large share of that superiority, which they so liberally bestowed upon their species. And it must be evident to every body, that nothing but vanity could induce them to publish doctrines so pernicious to mankind ; for, to do them justice, I do not think that they have any misanthropy in their nature ; but, on the contrary, I have known some of them that were very kind and friendly, provided, only, that you allowed them to be the greatest geniuses and finest writers of the age. And, though I have observed in them, likewise, the greatest malignity, and most inveterate hatred, against those who did not allow them the praise they claimed, yet I consider that rather as the necessary consequence of their vanity, the most vindictive passion in our nature when it is crossed and disappointed, than as a sign of any ill temper or malevolent natural disposition. The same was the character of the great author of their philosophy, Epicurus, who lived in great friendship with his admirers and followers, but could not bear those who differed from him in matters of philosophy. He, therefore, not only abused the philosophers who went before him, as Aristotle and Phaedo, one of the disciples of Socrates ; but there was one Timocrates, the brother of his most intimate friend and companion Metrodorus, against whom he wrote whole volumes, because he presumed to differ from him in some points of philosophy ; and, from the same principle of vanity, he was ungrateful to Democritus, from whom he had learned what is best in his philosophy ; and he treated very ill Nausiphanes his master ; but from whom he professed that he learned nothing *.

I have often thought that this immoderate vanity of theirs might be somewhat corrected at least, and their characters, as well as their taste, improved, if they were scholars, and could study antient history, as it ought to be studied ; for there they would find men so much superior to themselves in arts and arms, and in science too, except that

* Cicero de Nat. Deor. lib. I. cap. 33.

that they had not discovered there was no God, that I think that it is impossible their vanity should not be mortified by the comparison. And, if they could carry their learning still farther, and read Homer with good taste and understanding, considering him not only as a poet, but as an historian, they would find in him characters of men still superior; the heroes he describes being men that excelled others so much, both in body and mind, in council and in fight*, that they were by nature destined to govern; for those heroic governments, which obtained at that time in Greece, I consider as not of human institution, but from nature; for we see that, in all the herds of gregarious animals living in the natural state, there are some by Nature *designed* to lead and direct the rest; some kind of government being necessary in all societies; and this *designation* is marked by superior size, strength of body, and spirit†. These men, by the joint suffrage of all antiquity, were acknowledged to be much superior to the ordinary race of men, and to be something betwixt Gods and men, to which they gave the name of *hero*. From the study of such characters, as they are most accurately described by Homer, they might learn to form some notion of Natures superior to their own, and get free of that most absurd, and even impious vanity, by which they set themselves, as it were, at the head of the creation, and believe themselves to be the most excellent creatures that are, were, or will

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* 'Οι περί μιν βούλη Δαίμων, περί δ' ἔστι μαχέσθαι. ILIAD. I. v. 258.

This is the description which Nestor gives of the Grecian heroes who fought at Troy.

† Homer has described one of these heaven-born, and truly *jure-divino* kings, in the following lines:

— ἢ ἴδμεν Κροῦου παῖς ἀγνυλομήτω
Σέκπτρον τ' ἠδὲ θειότατος, ἵνα σφίσιν ἐμβασιλεύῃ.

be *. But it may be truly said of them, what Cicero says of their master Epicurus, 'Nihil olet ex Academia, nihil ex Licaeo, nihil ne 'e puerilibus quidem disciplinis †.' And they glory, too, as Epicurus did, 'Se magistrum habuisse nullum;' which, says Cicero, pleasantly enough, I should have believed, if he had not said so; as I would believe the proprietor of an ill built house, who boasted that he had employed no architect †.

CHAP.

* *Esse autem hominem qui nihil in omni mundo melius se esse putet, decipientis arrogantiae est. Cicero de Nat. Deor. lib. 2. cap. 6.*

† *Ibid. Lib. 1. cap. 26.*

† *Quod et non praedicanti tamen facile quidem crederem, sicut mali edificii domino glorianti, se architectum non habuisse. Ibid.*

C H A P. XIX.

The Philosophy of this Work different from the Newtonian Philosophy—particularly concerning the Motion of the Celestial Bodies—Opinion of the Antients, that these Motions were carried on and conducted by Mind—All Motion on Earth both begun and carried on by Mind—The same in the Celestial Regions, according to the antient Philosophy—The Newtonian Philosophy not so uniform or consistent with itself—The combined Motion of the Planets, according to the Newtonian System, not necessary nor probable—gives too great an Advantage to Atheism—lays not the Foundation of Theism broad enough, by supposing the World to have been produced at a certain Time—Opinion of all the Antients that it was eternal—If Mind moves the Celestial Bodies, it must be by a simple and uncompounded Motion—Sir Isaac's Gravitation of the Celestial Bodies a Fact, not a Cause—The Subtile Spirit pervading all Bodies an Occult Cause—savouring a little of Materialism—But this corrected in the Query annexed to his Optics—Three Opinions concerning the Origin and Continuance of Motion.—Dr Clarke's Opinion in this Matter different from Sir Isaac's.

THE system of philosophy contained in the preceeding sheets must already have appeared to the reader very different from the philosophy at present in fashion : And I am now to explain more particularly wherein this difference consists ; and to endeavour to support my philosophy, or rather the philosophy of the antients, (for I do not pretend to have invented any thing), against the Newtonian philosophy, in the points with respect to which they differ.

There is one point, in which, I hope, I agree with all the philosophers of the Newtonian school, as I am sure I do with the founder of it, and that is, the belief of the existence of a God, and that he is ultimately the Author of all the motion in the universe. But in this

we differ, that those philosophers maintain, that the motion, being once begun, is continued and carried on without *mind*, at least in the celestial regions; and that by far the greater part of the visible world is no more than a great machine: Whereas, on the other hand, I maintain, that, as the motion was begun, so it is carried on by mind, supreme or subordinate, in the celestial regions, as well as here on earth. This was undoubtedly the opinion of Plato and Aristotle *, and,

* As to Plato, he, in a passage above quoted, page 207. relates three several opinions concerning the motions of the celestial bodies, but all agreeing that *mind* was the moving principle. Of these three, it appears, from a passage in the *Epinomis*, (p. 1009. edit. Ficini,) that the opinion which supposed them to be moved by *mind* internal, in the same manner as our bodies are, and by a mind intelligent, and of the best kind, was his opinion; for he says there, that the universe is peopled with five different kinds of animals, whose bodies are composed of the five different elements, earth, fire, water, air, and aether, each predominating in each kind of animal, more or less. One of these five kinds of animals he makes the celestial bodies to be, consisting, as he supposes, chiefly of fire, their bodies of the finest kind, and animated by the happiest and best minds, γινώσκται δὲ διὰ διὰ πάντα τὰ κατὰ οὐρανὸν ταῦτα εἶναι ζῶον γῆν, (meaning the animals whose bodies are composed chiefly of fire,) ὃ δὲ καὶ χρὴ φανῆαι θεοῦ γένος ἁπλοῦς γινώσκονται, ὁμοῦ μὲν τύχον καλλίστου, ψυχῆς δ' εὐδαιμονιστάτης τε καὶ ἀρίστης. Then he proceeds to argue against those who, because their motions were so constant and regular, supposed them to proceed from matter and mechanism; whereas, says he, they ought to have concluded quite contrarywise; for, how absurd is it to admit that our motions, so much less constant and regular, are guided by an intelligent mind, and to deny that the movements of the celestial bodies, so much more constant and regular, are guided in the same manner? And he concludes with these remarkable words, διὰ διὰ, ὅσα φανερότερον ἐστὶ ἀνθρώπου μὴ τι λαρόντα γινώσκονται, οὐδὲν λαρόντα φαίνεται. ἥμας μὲν οὖν εἰ τις αἰτίας τινὰς εἰσι σώματων, ἢ φύσεως, ἢ τι τοιοῦτον, οὐδὲν σαφὲς εἰσι. The meaning of which is, 'That we poor mortals ought not to imagine ' that we have mind and intelligence, but that those glorious beings are mere bodies ' carried about by certain fluids, or moved by some kind of *nature* that nobody can explain.' From whence it appears, that the way of accounting for the celestial motions by fluids and vortices, is not a modern invention, but was a notion of the material and mechanical philosophers in the days of Plato.

As

and, as far as I know, of all the philosophers of antiquity, that were not Atheists. I hope, therefore, I shall be excused, if I endeavour to defend it, even against Sir Isaac Newton and his followers.

That all motion here on earth is not only begun, but carried on, by *mind*, so that, without the continual operation of mind, it would cease,
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As to Aristotle, he thought, as well as Plato, that there was a *ψυχή του κόσμου*, or *mind* animating the whole universe; for he has said expressly, that the *ουρανός*, by which he means the whole universe, is *εμψυχός*, or *animated*; *lib. 2. de Coelo, cap. 2. p. 454. edit. Du Val*, and the commentary of Simplicius upon the passage, folio 94. By which we are not to suppose, that either Plato or Aristotle believed that this mind was the Supreme God, which was the opinion of the Stoics, and, I think, of Spinoza, among the moderns, if there be any sense at all in his philosophy. But, on the contrary, it is evident, that both those philosophers believed that the Supreme God, the first person of the Trinity of Plato, was not only, in his own nature and essence, immaterial, but *χωριστός* and *εξηρημένος* from all matter, not being incorporated with any matter; and, therefore, altogether immoveable and unchangeable, and yet the Author of all motion,

—Stabilisque manens, dat cuncta moveri.

Boethius de Consol. Philos.

Further, Aristotle has expressly said, that, not only the whole *ουρανός*, or *universe*, has a mind belonging to it, but that the particular celestial bodies are all animated by several minds, and those minds intelligent. And he condemns the opinion of those who thought that they were mere inanimate bodies. His words are, *ἀλλ' ἡμῖς ὡς περὶ σωματῶν μόνον αὐτῶν, καὶ μονάδων τάξιν μὲν ἔχουσιν, ἀψυχὴν δὲ παντῶν, διανοούμεθα διὰ δ' ὡς μετεχόντων ὑπολαμβάνειν πράξεις καὶ ζωῆς*, *Lib. 2. De Coelo, cap. 12. p. 464. edit. Du Val*. See also, Simplicius's Commentary upon the passage, folio 117. where he shows that the word *πράξις*, in Aristotle's language, can apply only to intelligent beings; and it is in this way that Aristotle accounts for the seeming irregularity of their motions, which, he says, must be understood to be all for the best, though we be not able always to find out the purposes they serve.

I hope, therefore, the prejudice against antient philosophy, and in favour of the modern, is not yet so great, that I should be thought arrogant or presumptuous, in endeavouring to support the antient against the modern, in this particular of the principle of the motion of the celestial bodies.

is a fact that I think cannot be denied, at least with respect to animal and vegetable bodies. For, *first*, Mind is the cause of all the spontaneous motions of our bodies, as must be acknowledged by every philosopher who admits the distinction betwixt *body* and *mind*. And it is, I believe, the opinion of all the philosophers in Britain, that the same kind of motion in other animals is produced by the same cause. It is true, in producing these motions, it operates by the mechanical powers of muscles, sinews, and bones, by which the motion, begun by mind, is continued and propagated to the extremities of the animal body, and from thence to external bodies. But, without the unceasing operation of mind, not only impelling at first, but renewing the impulses from time to time, the motion very soon ceases. As to the involuntary motions in animals, such as the circulation of the blood, respiration, digestion, and the like, by which the animal life, growth, and nutrition, are carried on; till these be explained, by material and mechanical causes, which hitherto has not been done, and, if I may venture to prophecy in matters of philosophy, never will be done, I must ascribe these likewise to *mind*, but to a mind of a different kind, commonly known by the name of the *vegetable life*, being the cause of similar motions in the vegetable. Further, the motions of unorganized bodies here on earth, such as the motion of gravitation, till it shall be accounted for from any mechanical cause, I must also ascribe to *mind*, and to mind indefinitely operating, which, in the case of gravitation, produces a motive force that is always increasing and accumulating. And, *lastly*, The motion of projectiles here on earth is evidently from mind, that is, from animal force, applied either mediately or immediately to the bodies moved, but with this difference betwixt it and the natural motion of bodies towards the centre, that the motion of projectiles is continually decreasing, till, at last, it ceases altogether; whereas the motion of gravitation is continually increasing.

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In this manner is motion produced and continued here on earth— In the same manner, according to the antient philosophy, is motion carried on in the celestial regions, with this difference, that the celestial bodies have all of them, as far as they are within the reach of our observation, a constant regular motion, of a circular kind, either round a center, or upon their own axis, or both ; whereas no body here on earth has any constant motion of that kind.

According to this philosophy, therefore, the system of the universe is uniform and the same, with respect to this great agent in nature, *motion*, which is produced and carried on by *mind* here on earth, above, below, and round about us. The Newtonians, on the other hand, are reduced to the necessity of making a distinction betwixt the movements here below the moon, at least so far as regards animal and vegetable bodies, and those in the celestial regions. The former they must admit to be carried on by the continual operation of mind acting upon body, either immediately or mediately, by the intervention of other bodies. As to the celestial bodies, they maintain, that the planets, both primary and secondary, gravitate towards their respective centres, in the same manner that bodies here below gravitate towards the centre of the earth. By this motion, if there were no other, all the celestial bodies of our system would run together into one mass ; but the Almighty, say they, has given another motion, viz. an impulse in a straight line, by which, and the power of gravitation combined, the planet is moved round the center of its motion in an elliptic curve, so that it is sometimes nearer its centre, sometimes at a greater distance from it, and varies its movement accordingly, sometimes moving quicker, and sometimes moving slower. In this manner, they say, the planets have continued to move these six thousand years, like a piece of clock-work, without any interposition of mind, and by mere mechanism, and may continue to be so moved to all eternity, if the Almighty Power do not interpolate in an extraordinary and
miraculous

miraculous manner. Sir Isaac, it is true, says, in his *Principia*, that, even while the system lasts, it may deliderate the mending hand of the Creator. But the meaning of this, as he has explained it in the Query at the end of his Optics, is, that the action of the comets upon the planets, or of the planets upon one another, may, in a great length of time, disturb their movement so much, that a mending hand will be required. But Sir Isaac does not seem to understand, that the *centripetal* and *centrifugal* forces, as they are called, which he supposes to be originally impressed upon them, will ever fail.

From this account of the Newtonian Astronomy, it is evident, that the system of the heavens is, according to it, a mere machine, very different from any thing to be seen on earth, where there is no *perpetuum mobile* of a machine, neither of the workmanship of nature, nor of man, and where all the natural movements of bodies, whether organized or unorganized, are simple and uncomposed, not being combined of motions counteracting one another. The Newtonian Philosophy, therefore, is not so simple or uniform, nor so universal, as its followers would make us believe; and I have always thought that it would be more consistent, and better explain the whole of nature, if they could make machines of the bodies of all animals, as the French have done of the bodies of brutes, and allowing them to have been made, and once set agoing by God, have shewn that they might go on like the celestial bodies, by the power of matter and mechanism merely. Such a philosophy would have comprehended heaven and earth, and established an universal law of nature, extending thro' the whole universe; whereas, in the Newtonian Philosophy, as it stands, there is wanting that analogy and unity of design, which every part of nature seems to indicate.

Sir

Sir Isaac's astronomy supposes, that the power of gravitation, by which bodies tend towards some center, extends through the whole universe, at least, through all our system. 'This power,' says Sir Isaac, 'I do not affirm to be essential to matter, or inherent in its nature*.' I wish he had said the thing more strongly, and had affirmed positively, 'That a power of moving itself was not essential to matter;' as every body who says the contrary is plainly an Atheist, in consequence of that principle, whether he knows it or not. The Newtonians, therefore, to avoid that imputation, must admit, that the motion of gravitation is from mind, mediately or immediately, as well as the projectile motion of the planets; and, as their philosophy does not suppose that the Deity acts indefinitely upon matter, far less that there is any mind, or internal principle, acting constantly upon body, they must needs suppose, that gravitation, as well as the projectile motion, is produced by one impulse given by the Deity, and which still continues to operate with undiminished force. But this, as I have said, is mere hypothesis, not at all necessary, nor even probable. It might have been said to be necessary, if we could have discovered no other natural movement in body, except a tendency towards a center; but, as there are so many other natural movements in body, one directly opposite to this, it is far from being necessary to suppose this single movement to be universal in Nature; and, not only it is not necessary, but it is very improbable, when we consider, that animals here on earth perform such motions as those of the planets, tho' not constantly, but occasionally, nor with the same regularity, as may be well supposed. Why, then, ought we not to believe, that the heavenly bodies perform the same motion, animated by the same principle—*mind*, and even *intelligence*, as the antient philosophers supposed? It is a common way of arguing among the Newtonians, that, where we see the same effects produced, we are to suppose the same cause. Now,

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* Gravitatem corporibus essentialem esse, minime affirmo. *Principia Mathematica*, vol. 3. *Regula Philosophandi 3tia*.

the planets have the same kind of motion ; Why not assign the same cause for it ? Why, rejecting this cause, should we suppose a combined motion, such as is not to be found any where in Nature besides, unless where some kind of violence is offered to Nature, as in the case of projectile motions here on earth ?

But what I dislike most in Sir Isaac's philosophy is, that it gives a great deal too much countenance to the Atheistical system, though, I am firmly persuaded, that was not intended by Sir Isaac : For, if the celestial machine has gone on for six thousand years, and may, by its nature, go on to all eternity, the Atheist will ask, Why it may not have gone on in the same way from all eternity ? and Theism will be embarrassed with the difficulty of distinguishing betwixt eternity *a parte post*, and *a parte ante*, and of showing, that a thing may be eternal *ex parte post*, and not *ex parte ante* ; a distinction that is not made by any antient philosopher *, and, I doubt, cannot be well supported upon any principles of philosophy.

Neither does this philosophy of Sir Isaac lay the foundation of Theism broad enough : For it necessarily supposes, that the universe had a beginning in time, because the impulse or impulses, by which the celestial bodies were put in motion, must, of necessity, have been given at some determined time. Now, this system of Theism excludes all the philosophers of antiquity, without exception ; particularly Pythagoras, his scholar Ocellus Lucanus, the most antient philosopher of whom we have any remains, whose authenticity we are sure of, Archytas the Tarentine of the same school †, likewise Plato, tho' I know that is disputed, but without any good reason, as I shall show in the proper place, Aristotle his scholar most certainly, and all the

Plato, in his argument in the Phædo to prove the immortality of the soul, does plainly make no such distinction ; but, on the contrary, argues, as if the prae-existence of the soul was necessarily connected with its post-existence ; and proves the one by the other. And, in the same manner, Cicero argues in his book of Divination.

† See Gales's preface to his edition of Ocellus Lucanus's work *De Universo*, published among his *Opuscula Mythologica*.

Platonics of later times, without exception, such as Plotinus, Porphyry, Jamblichus, and Proclus. For all these maintained, that the universe was an eternal emanation of an Eternal Being, to whose essence, energy, and that principal energy of production and preservation, belongs; nor could they conceive a time when the wisdom and goodness of God were not manifested in the works of creation.

I know this doctrine of the eternity of the world is generally thought to be adverse to the account of the creation given by Moses. But I say, *1mo*, That, though the truth of revelation must necessarily be founded upon natural religion, and the belief of the existence of a God, it is not proper that a philosophical system of Theism should be built upon revelation. *2do*, It is not at all necessary so to interpret the words of Moses; for the Scripture, in speaking of the acts of Divine power, uses a language suited to the capacity of men, as might be proved by very many examples. Now, as all the productions, we are acquainted with, are in time, and exist posterior to their causes; and, as it is difficult, and, I believe, to many people, impossible, to conceive a thing produced by another thing, as its cause, and yet co-eternal with that cause, Moses, speaking after the manner of men, makes the world to be produced, like the other productions we see, in time. And, in like manner, the Psalmist, speaking of the Messiah, makes God say, 'Thou art my Son, this day I have begotten thee;' though I hold no man to be a Christian, and not even a perfect Theist, who does not believe in the eternity of the Second Person of the Trinity; and, 'That he was begotten from everlasting of the Father,' according to the language of the Church of England. And I think the most dangerous heresy in the Christian Church was that of Arius, who maintained, 'That time was when he was not*.' And it is Plato, speaking in the same manner, in the *Timæus*, of the production of the world, that has led some modern philosophers to think that he believed the production of it to be temporary†.

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Lastly,

* His expression was, *ἦν, ὅτε οὐκ ἦν.*

† The notion of the temporary production of the world was no older than the second or third century, and began among the Christians, mistaking, as I think, the sense.

Lastly, Upon the supposition that mind moves the celestial bodies, as it does every thing else, I say it is impossible they can be moved in the

sense of Moses, and differing in this point from the Jews themselves, as appears from what Philo Judaeus has written in his treatise, *περί της αφθαρσίας του κοσμου*. This new doctrine began to be received, as I imagine, about the time that the notion was introduced into the Christian Church, but without any warrant from Scripture, of the souls of men being created later than their bodies, and infused into them: But this was a notion that would not go down, even with all the Christians. And one of them, Synesius, a writer of the fourth century, could not be persuaded, by the offer of a bishoprick, that his soul was the younger brother to his body; see Cudworth's Intellectual System, pages 38. and 39.; where he has given us the words of Synesius, which are, *αμίλλει την ψυχήν ουκ αζιωνει ποτε σωματος υπεργουνη νομιζειν*. And, if he believed that souls were from all eternity, it is not likely that he believed the universe to be only five or six thousand years old. Philoponus, the commentator upon Aristotle, who was a Christian, has thought himself bound, it would seem, by the religion which he professed, to write in defence of the temporary production of the world, against Proclus, who maintained the opinion of the antient philosophers, that it was eternal. In this treatise, which is preserved to us, Philoponus endeavours to prove it to be impossible, by the nature of things, that the world, being made by God, should be coeval with its Maker. But it is evident that he proceeded upon the vulgar and gross notion, of the world being made by God, in the same manner as a piece of work is by a human artist. In that case, no doubt, the cause producing must be prior in time to the production; but he ought to have learned, from the authors that he had studied and commented upon, that the productions of men, and, in general, all productions here on earth, are very improperly compared to the productions of God, which are all emanations of his Nature, as necessary as his Nature itself. Cudworth, who is a most candid reasoner, and fair inquirer, upon every subject that he has treated, frankly acknowledges, that 'he is prone to believe, that, could the world have been from eternity, it should certainly have been so.' Intellectual System, page 887. By which he means, that there should have been from all eternity this manifestation of the goodness, wisdom, and power of God, if it had not been absolutely impossible, by the nature of things. But, Where is the impossibility that a thing should have been from all eternity, that is admitted to have existed for 6000 years, and may exist we do not know how many thousand years longer? What is, by nature, impossible, implies a contradiction; and what implies a contradiction, cannot exist for a moment. But, upon this subject, I will say a great deal more in the second part of my work, where I will show, that, though those pious antient philosophers asserted the world to be eternal, they did not, therefore, believe, that the matter of which it was made is independent of God; but they held, that the *matter*, as well as the *form* of the

the double way that Sir Isaac supposes. If, indeed, we could believe that the principle of gravitation was essential to body, and inherent
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the universe, did all proceed from one first cause. And this, I think, is enough to satisfy every Christian, as well as every Theistical philosopher. I will only add here, that, not only the Theistical philosophers of antiquity, but also the Atheistical, were of opinion, that the universe was eternal; for Epicurus, and his followers, maintained, that their worlds had no beginning, but were from all eternity, one going down, and another rising up; and so succeeding one another, without end. For they believed that there was an infinite number of worlds, each independent upon the other: Whereas, the schools of Plato and Aristotle maintained that the universe was one system, whereof all the parts were connected, and dependent one upon another; but, as it was material, and all matter being, by its nature, liable to change and vicissitude, they maintained that the universe had suffered in time past, and would suffer in time to come, great changes; so that what we know has happened in our earth, they conceived had happened, and would happen in every part of the universe; but still the system would be preserved in the same manner as the system of an animal or vegetable body is preserved, notwithstanding the constant changes that it undergoes. And the only difference they made betwixt the two was, that, in the animal or vegetable, the changes are much quicker; whereas, in the universe, they are very much slower, and the successive states of it of infinitely longer duration.—Whoever is shocked with this antient notion of the eternity of the world, may read what the learned and pious Dr Clarke has said upon the subject, in his *Demonstration of the Being and Attributes of God*, (page 35. 4th edit.) where he very fairly acknowledges it to be the opinion of the antient philosophers, and even of Plato, though, as I have observed, that has been disputed; and, like Dr Cudworth, shows no abhorrence of it, nor thinks it at all irreconcilable to genuine Theism. His words are, ‘That the followers of Plato maintained, that the creation of the world was not to be understood a creation *in time*, but only *in order of nature, causality, and dependence*; that is, that the will of God, and his power of acting, being necessarily as eternal as his essence, the effects of that will and power might be supposed coeval to the will and power themselves; in the same manner as *light* would eternally proceed from the *sun*, or a *shadow* from the *interposed body*, or an *impression* from an *imposed seal*, if the respective causes of these effects were supposed eternal.’ And, for these similitudes, he quotes antient authorities. As fit a similitude, I think, may be taken from the definitions and axioms of science, and the propositions proved by them; for these propositions are truths as eternal as the definitions and axioms, which, however, are undoubtedly the cause of their being true. And hence it is, that they are said to be proved *a priori*, meaning, not priority in time, but a priority of causality, as Dr Clarke expresses it. But, notwithstanding these authorities and illustrations, I would not be understood to affirm any thing at present

in its nature, the consequence would necessarily be, that the motion must be combined : For the Deity must have given a projectile force to the body, in order to counteract and overcome so far its gravitating power, so that it would be a contention, as it were, betwixt material necessity and the power of the Deity ; the result of which is a kind of compromise, by which neither the one nor the other prevails, but the matter is divided pretty equally betwixt them. But, though Sir Isaac do not positively affirm, that gravitation is not essential to body, I am persuaded, that he believed the one movement, as well as the other, to be produced by mind ; and, if so, it is impossible to suppose that the motion of the planets should be combined of two motions ; for, how can we suppose that mind, whether supreme or subordinate, would use two movements, when one simple one, in a circular or elliptical line, would do the business ? This would be a supposition, contrary to the first law of philosophising laid down by Sir Isaac, 'That Nature does nothing in vain ; and, that it is in vain to do a thing by many means that can be done by fewer.' And again, 'Nature is simple, and does not wantonly abound in superfluous causes of things* ;' and, if we were to suppose Nature so superfluous, it is not easy to conceive how it could be done ; for, we cannot conceive that mind, in order to produce one motion, should first give the body a movement towards the center, and then the projectile motion, by which it is carried from the center ; and if, at once, it was moved in the ellipsis, it is, to me at least, inconceivable how it should be moved at one and the same time, and by the same moving power, two motions.

present positively on this subject ; all I mean to show is, that it is much too narrow a system of Theism, which excludes from the appellation of *Theist* so many philosophers who have been always esteemed, not only Theists, but many of them very religious men.

* *Natura nihil agit frustra, et frustra fit per plura quod fieri potest per pauciora.—Natura enim simplex est, et rerum causis superfluis non luxuriat. Principia Mathematica, vol. 3. Regula Prima Philosophandi.*—And in this he agrees with Aristotle, who has said, speaking of the motion of the celestial bodies, that *God and Nature do nothing in vain.* τὸ δὲ Θεὸς καὶ ἡ Φύσις οὐδὲν μάτην ποιοῦσι. *Lib. I. de Coelo, cap. 4. in fine.*

motions so contrary. Even if we were to suppose that a principle of movement was essential to the body, or, in other words, that the body moved itself, how could we conceive that it should move itself two opposite ways at once, or, that there should be two principles of movement in the same body counteracting one another.—In short, if the universe be governed by one principle, whether *mind* or *matter*, it appears impossible that the motions of the celestial bodies should be mixed of such different motions, and that, therefore, Sir Isaac's system cannot be defended, except upon the hypothesis of two principles in the universe controlling and counteracting one another ; an hypothesis which I am far from thinking Sir Isaac meant to maintain.

I have never heard any thing said against this reasoning, except that the nature of the circular or elliptical motion is such, that, supposing no previous tendency to the center, yet it cannot be performed without both that tendency, and a tendency to fly off in a tangent, or straight line ; so that it is necessarily a composed motion of a centripetal and centrifugal force.

If this proposition can be demonstrated, I must no doubt submit to it. This, however, is not pretended ; but I have been told, that the evidence of it is superior to any demonstration ; for it is an axiom. But this I venture absolutely to deny ; for, though I do not pretend to have learned any more than the elements of geometry, axioms and definitions belong to the elements. Now, I have learned from my masters, the antients, in geometry, as well as every other science, that the circle or ellipsis is the most simple of all figures, being described by one line revolving into itself ; whereas, every other figure must be formed by more than one line, and, if it is a rectilineal figure, by three lines at least ; consequently, the circular or elliptical motion, must, of all motions describing figure, that is, inclosing space,
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be the most simple, and the least varied and compounded *. Further, I say, that no proposition, repugnant to common sense and observation, can be an axiom. Now, let any man move in a circular or elliptical line described to him, and he will find no tendency in himself, either to the center, or from it, much less both. If, indeed, he attempt to make the motion with great velocity, or, if he do it carelessly

* Proclus, who was both a geometer, and a most sublime philosopher, in his second book upon the Elements of Euclid, p. 23. accounts for Euclid beginning with the rectilinear figures, such as triangles and squares, and not with the circle, in this manner: *Εἰ γὰρ καὶ φύσει κρείττων ὁ κύκλος, καὶ ἡ περὶ αὐτοῦ πραγματικὴ τῆς τῶν εὐθυγραμμῶν οὐσίας τε καὶ γνῶσις, ἀλλ' ἤμιν προσηκουσα μᾶλλον ἢ ἡ περὶ τούτων διδασκαλία τοῖς ἀτελεσιτέρας, καὶ ἀπὸ τῶν αἰσθητῶν ἐπὶ τὰ νοητὰ μεταγίγιν' τὴν διανοίαν σπινδύουσι. Καὶ γὰρ τοῖς μὲν αἰσθητοῖς οἰκῆται τὰ εὐθυγραμμία σχήματα, τοῖς δὲ νοητοῖς ὁ κύκλος· δι' ὅτι δὴ τὸ μὲν ἄπλουν καὶ μοιροειδὲς καὶ ἁρισμένον προσηκεῖ τῇ φύσει τῶν οἰτῶν, τὸ δὲ ποικίλον καὶ ἀορίστως αὐξανόμενον τῷ πλήθει τῶν περιεχουσῶν πλείω διαφέρει (λέγε προσηκεῖ) τοῖς αἰσθητοῖς.* The passage is incorrectly printed, as almost all the works of those later philosophers are, either from the defect of the manuscripts, or the inaccuracy of the printer. I have already corrected one word in it; and there is another part of it which needs correction. It is where the word ἀτελεσιτέρας occurs, to which should be added the words, *τὴν διανοίαν ἔχουσι, καὶ ἀπὸ τῶν αἰσθητῶν ἐπὶ τὰ νοητὰ μεταγίγιν' αὐτὴν σπινδύουσι.* But, be these corrections as they may, the general sense of the passage is clear, which is, 'That, tho' the circle be the most simple, uncompounded, and determinate figure of any, therefore first in the order of nature, and most resembling things intelligible; yet it is more proper for those of imperfect understandings, and who, therefore, must by degrees proceed from things sensible to things intelligible,' (for this, as I have observed elsewhere, page 4th, was understood, by antient philosophers, to be the chief use of mathematics,) 'to begin with rectilinear figures, because they being compounded, and consisting of more or fewer lines, which may be increased at pleasure, resemble sensible things more.' In the same manner, Aristotle proves, in the second chapter of his first book *De Coelo*, that the circle is more simple and perfect than any rectilinear figure, because the straight lines, of which any rectilinear figure is composed, may be increased or diminished at pleasure; so that they are not compleat in themselves; whereas, the line which forms the circle, can admit neither addition nor diminution, and therefore is compleat in itself: And, as the line which forms the circle is perfectly simple, so also is the motion in that line. And, in the next chapter, towards the end, he says, that the circular motion, and the motion in a straight line, are the only simple motions.

lessly and inattentively, he may go out of the line, either towards the center, or from it; but this is to be ascribed, not to the nature of the motion, but to our infirmity, or, perhaps, to the animal form, which is more fitted for progressive motion in a right line, than for any kind of curvilinear motion. But this is not the case of a sphere or spheroid, which is equally adapted to movement in all directions.

The vulgar, I know, will think it incredible, that a sphere should be animated, or, that mind should move body, otherwise than by the machinery of bones, muscles, and sinews; but the philosopher, who has more enlarged ideas of *mind*, and its *powers*, and knows that the whole universe is moved by the Supreme Mind, without the aid of any such machinery of any kind, will reject such a narrow notion, and will ridicule it in the same manner as the learned philosophers of old ridiculed the fancy of Epicurus, that intelligence could only be in the human form; for which reason, he gave that form to his Gods *.

What has led men into this mistake, concerning the circular motion, is motion produced by material and external impulse; that is, by one body impelling another. In such a case, as that motion is always in a straight line, it is evident that several impulses, in different directions, are absolutely necessary, in order to form a circle or ellipsis; but, where mind is the mover, and especially mind internal, as I suppose, there can be no difficulty in conceiving the motion to be made simply and in a natural way; or, rather, it is impossible to conceive it otherwise.

Thus, I think, I have proved, that, if the celestial bodies are moved by mind, and by mind not controuled by material necessity, they cannot

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* Cicero *De Natura Deorum*, lib. 1. cap. 27.

be moved by a compounded motion, such as the Newtonians suppose. The case of projectiles here on earth is evidently different; for they are moved by animal force, or some other external impulse, controuled by the power of gravitation previously in the body, which being a natural and internal principle of movement, counteracts, and, at last, overcomes the adventitious and external impulse, making the body describe, while in motion, a curve, called a *Parabola*; and this motion is really and actually compounded of the motion of gravitation and the projectile motion, both operating at the same time.

It was the analogy betwixt this motion of projectiles here on earth, and the motion of the celestial bodies, which Sir Isaac has investigated and discovered with wonderful sagacity, that made him suppose their motion to be produced in the same way; and, that the motion given by the Almighty to the planets, was, in like manner, controuled and bended from the straight line, by the force of gravitation.

And the great argument urged by the Newtonians, in support of their system, is, that the same cause must produce the same effect *.

To this argument I answer, that I admit it is the same cause which produces the motion of projectiles on earth, and the motion of the moon, and other celestial bodies, namely *mind*, the author of all the motions in the universe, according to my system. But there is nothing to hinder the same cause to produce the same effects, by different means, if there can be a reason assigned for the difference of the means. For, however ridiculously Mr Leibnitz may have applied his grand principle, of a sufficient reason for every thing, I hold it to be an axiom of natural philosophy, nor can I conceive intelligence of any kind, much less the Supreme Intelligence, acting without a reason, in any

* See M'Laurin's Account of Sir Isaac Newton's Philosophical Discoveries, book III. chap. 2. *in fine*.

any the least thing. Now, the reason of the motion of projectiles here on earth being produced by two powers operating differently, is, that it was necessary those two powers should exist; for the system of nature here below could not have been carried on without both gravitation and projection, whether by animal force, or by some other external impulse; whereas, in the celestial regions, there can be no reason assigned for a double force being applied for producing the simplest of all motions, by which space can be inclosed. This, as I have shown, would be contrary to a fundamental law of nature, acknowledged by Sir Isaac Newton. At the same time, as the two motions are precisely of the same kind, it is perfectly agreeable to the wisdom of Nature, and that uniformity of design that we see in all her works, that they should be governed by the same laws. Now, that the motions are the same, is admitted by all the philosophers of this school, and, indeed, is the foundation of their system: For they tell us, that 'the moon is a projectile; and that, if she were brought down to earth, and projected in the same line, and with the same velocity as bodies here on earth, she would move in the same curve; and, if any body was carried from our earth, to the distance of the moon, and was projected in the same direction, and with the same velocity with which the moon is moved, it would proceed in the same orbit which the moon describes, with the same velocity *.' And they tell us, that every projectile, if the projection was of sufficient force to overcome the resistance of the medium, and the force of gravitation towards the earth, would go round the earth as the moon does; and the same conformity that is betwixt the motion of the moon and projectiles upon earth, has been shown to take place betwixt the motions of other satellites round their primary planets, and of the primary planets themselves round the sun. Now, it would be something anomalous and incongruous in Nature, if two motions of the

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* See M'Laurin, *ubi supra*.

same kind were not governed by the same general laws, but with such difference, as the different masses of the bodies, and their different distances from the center, ought to produce. For I hold it to be a general law of Nature, that things related do mutually affect one another, and different relations of things produce different effects; for, otherwise, the relation would be to no purpose, contrary to that axiom, as it may be called, of natural philosophy, 'That Nature has done nothing in vain.' Now, there is certainly a relation betwixt the body that is moved round, and the body round which it is moved; and, as all relations are mutual, these two bodies, therefore, must mutually affect one another; and it would be anomalous in Nature, and out of rule and order, if the different proportions of masses, and of distances, betwixt the bodies surrounded and surrounding, made no difference as to the motion of the surrounding bodies. All these differences Sir Isaac has combined, and estimated the effects of them, with wonderful sagacity, and has shown a power of investigation and deduction, which does honour to the human genius, proceeding from what is compounded to what is simple, from effects to causes, and from particular causes to causes more general; from the motions of bodies, inferring the moving forces; and, from the analysis of the motion of projectiles here on earth and of the celestial bodies, and the comparison of those two motions thus analyzed, raising general theorems of motion; and, *lastly*, from those theorems reasoning downwards, and, in that way, accounting for many phaenomena of nature, of which no account had been given before, and which were therefore judged to be irregularities and enormities in the system. I should still admire Sir Isaac more, if I had gone deeper into mathematics; but, having only learned, as I have said, the elements of geometry, the principles of the science, and the manner of reasoning used in it, I cannot pretend to follow Sir Isaac in his demonstrations and calculations; which, therefore, I must content myself with *believing* only, to be perfectly just and accurate; and, if I could suspect any mistake in Sir Isaac's calcu-

calculations, I am most firmly convinced of the truth of the Pythagorean maxim, 'That every thing in nature is according to number and 'measure;' that not only the distances and periods of the planets are regulated by certain proportions, but that all things in Nature, which are homogeneous, and consequently susceptible of ratios and proportions, are regulated in the same way. And, not only has he applied the principles of geometry and mechanics to the motions of the celestial bodies, better than any man that ever existed, but he has made more curious experiments than ever man made, upon the most subtle of all bodies, *light*; and has, by a most wonderful dissection and unravelling, '*untwisted all the shining robe of day,*' as it is well expressed by Mr Thomson, in his poem upon the death of Sir Isaac Newton.

As a geometer, therefore, and experimental philosopher, I admire Sir Isaac as much as any of his followers can do, at least, as much as my small knowledge in these matters will allow me to do. He has, no doubt, explained wonderfully well the mechanism of the system, and shown by what laws all the various motions in the heavens are governed; and I only differ from him as to the *moving power* of the machine, which I make to be *mind* operating simply and uniformly; whereas Sir Isaac makes it to be either *mind* operating in a double and very complicated way; or, as that appears to be impossible, I rather believe he thought, though he has not said so, that there was some necessity in matter, that made it tend towards a center, and which, therefore, made the combined motion necessary. He has therefore made of the heavens a machine of an extraordinary kind, of which, the power that first set it agoing, he acknowledges to be *mind*: but he makes it to go on without that power; whereas, all the machines that we know, are moved only by the constant operations of the power which first sets them a-going.

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If this machinery, extraordinary as it is, could have been extended from the heavens to the earth, and it could have been shown, that things here, I mean animals and vegetables, and the minute particles of matter, were moved in the same way, Sir Isaac's system, as I have already observed, would have been more simple and uniform, and his philosophy would have been, as his followers boast, universal. But, as that is not pretended to be the case, his system of nature is, in this respect, incongruous, without that simplicity and uniformity of design, so remarkable in all the works of nature. And this incongruity betwixt Sir Isaac's system of the heavens and of the earth, must appear the more extraordinary, when we consider, that his whole system is built upon the analogy betwixt certain motions on earth and those in heaven.

Had Sir Isaac studied the books of antient philosophy, which it does not appear he ever looked into, probably for want of knowledge of the language in which they are written, he would have formed a more comprehensive idea of *philosophy*, and what a *philosopher* should be. He would have learned there; that *philosophy is the knowledge of all things divine and human*; that is, of things eternal and unchangeable, as well as of things perpetually fluctuating betwixt generation and corruption, that is, betwixt being and no being: And that, however excellent a mathematician or mechanic a man may be, however accurate and sagacious he may be in making experiments, without that universal knowledge, he is no philosopher, but is only possessed of inferior arts and sciences, which may be used as ministers or handmaids to philosophy. — From these books, he would have learned to know, what *body* and *mind*, *matter* and *motion*, in their full extent, are; and thence he would have discovered, that *mind* was not only principal in nature, but as universal as *body*, as different in kind and degree, and the author of all the motions in body; consequently, that *Nature* was nothing else but what Aristotle has made it to be, *mind in body*, or, as that philosopher has expressed it,

a *principle of motion*, by which body is moved in all the ways possible. Had he known this, he would not have made a *machine* of the heavens, nor divided the celestial motions betwixt mind and mechanism, the Divine Power and material necessity, but would have acknowledged, that all motion there, as well as on earth, was both begun and carried on by mind; and so would have formed a more universal, as well as more simple philosophy, comprehending both heaven and earth, and all things that are therein: For it is impossible that philosophy can be the knowledge of the universe, and of the first cause of things, unless it comprehend the knowledge of *mind*, which is so much diffused thro' all nature, and is the author of all motion, and, by consequence, of all generation and production of every kind. Accordingly, all the antient philosophers, particularly Plato and Aristotle, have made mind an essential part of their system, whether relating to things in heaven, or things in earth. But Sir Isaac, as he knew nothing of the antient philosophy, was not, I am afraid, learned in the philosophy of mind; and, therefore, he has endeavoured to explain every thing in the heavens by what he thoroughly understood, I mean geometry and mechanics; and would have done the same, if he could, with respect to things on earth.

Sir Isaac, therefore, I doubt, in antient times, while philosophy flourished, would not have been dignified with the name of a philosopher; and, I am afraid the philosophers of those days would not have been quite satisfied, even with his system of astronomy being formed upon a principle which is not a cause, but a fact, as his followers now admit. Now, a philosopher desires to know the causes and principles of things; for philosophy, as Aristotle tells us, is the knowledge of causes; and we can then only be properly said to know a thing, when we know the cause of it. But, what is worse, it is a fact which is only *supposed*, not proved; and, I think I have shown, that it is not a probable supposition, nor a necessary one, since all the phaenomena

nomena of the motions of the celestial bodies may be explained without it.

Final causes, as Aristotle has observed, are the principal causes: And, indeed, every man who believes that the universe is the production of intelligence and design, must hold that the final cause is, as the name imports, the *cause of causes*, being that, for the sake of which the other three causes are employed: For, if it had not been for a certain end, the *efficient* cause would not have operated; the *formal* would not have given a nature and essence to the thing, fit to answer the end intended; and *matter* would not have been employed to produce a *visible* world. Further, the beauty of nature, as Aristotle has observed, consists in final causes, without which we can conceive no beauty in any thing *. Now, if we are to judge in this matter by final causes, it is evident that the principle of motion, we call *gravitation*, was absolutely necessary here below, as the business of nature could not be carried on without it. But, in the celestial regions, it serves no purpose, except what can be served in a more natural and simple manner without it.

But gravitation is not the only fact which Sir Isaac's system of astronomy supposes; for there is another which he also requires us to believe, and that is, the impulse of projection given by the Deity to the celestial bodies. Now, this is a postulatium which none of the philosophers of antiquity, who, as I have shown, all believed the world to be eternal, would have granted; because it plainly supposes the world not to have been an eternal production of an eternal cause, but to have been made and set agoing at a particular time, like any piece of human machinery.

Thus,

* Το γὰρ ἢ τυχαῖος, ἢ ἀπὸ τινὸς ἐν τοῖς τῆς φύσεως ἔργοις, ἔστι καὶ μάλιστα. ἐν δὲ τῇ οὐρανῷ ἢ γίγνεται τέλος, τῇ τοῦ καλοῦ χάριτι εἰληφθῇ—*De Partibus Animalium*, lib. 1. cap. 5.

Thus, it appears that Sir Isaac's astronomy, instead of assigning the *cause* of the motions of the heavenly bodies, lays down two *facts* as *postulata*, which he desires should be granted to him, but which are neither necessary nor probable. If, indeed, it could be proved, that the circular motion is *actually* combined of a centrifugal and centripetal tendency, both these hypotheses would have been altogether unnecessary. But this, I am persuaded, was not the opinion of Sir Isaac himself; nor do I know that it has been advanced in print by any of his followers: I must, therefore, till I am better informed, hold the antient opinion to be the truth, that the circular motion is a simple uncompounded motion.

But, even upon this supposition, Sir Isaac, I think, was not driven to the necessity of his two *hypotheses*; for, though the circular motion of the celestial bodies be not *actually* compounded of gravitation and projection, there is nothing to hinder it to be resolved or analyzed into these two motions in different directions, in the same manner as the motion of projectiles on earth is analyzed; for the rectilinear motion, though most perfectly simple, may be analyzed into two motions, in the direction of two lines forming the sides of a parallelogram, of which the line of the body's motion is the *diagonal*, without the least necessity of supposing, that the rectilinear motion was actually produced by two forces acting in the direction of the two sides of the parallelogram, or that it has any tendency to go anywise out of a straight line, either to the right or left *. In this way, all Sir Isaac's demonstrations and calculations, arising from the resolution of the motions of the celestial bodies, will stand upon as firm a basis as ever, and his system be much more simple and plain, being disencumbered of two

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* See Mr M'Laurin upon the Philosophical Discoveries of Sir Isaac Newton, book II. chap. 2. p. 121. 122. and 157.

hypotheses, which, in every respect, appear to be altogether unnecessary*.

And, indeed, I cannot help thinking, that Sir Isaac went a little out of his province, as a geometer and mechanic, when he meddled at all with the cause or principle of motion of the celestial bodies; for mathematics can do no more than calculate and compare together motions and

* As the circular or elliptical motion is proved, by fact and observation, to be resolvable into two motions, one from the center, the other to it, I thought that there must be some reason for this, and that the reason was no other than the nature of the motion. And, as it is demonstrated, and was known even to the antients, that a motion in a straight line, as simple as any motion can be conceived to be, is nevertheless resolvable into the two motions mentioned in the text, I suspected that it was likewise demonstrable *a priori*, that the circular or elliptical motion was resolvable into the centripetal and centrifugal motions; and, accordingly, upon inquiry, I am informed that Sir Isaac has actually demonstrated it to be so. Now, this being the case, it appears that those who maintain that the orbicular motion is necessarily composed of the centripetal and centrifugal motions, are only mistaken in supposing that it is *actually* so composed; and, therefore, that it has a double tendency, to the centre, and from it. Whereas, if they had said, that the motion, though perfectly simple in itself, as simple as the motion in a straight line, was nevertheless composed of the centripetal and centrifugal motions, in so far as to be resolvable into these, it would have been no more than the truth, and would have served every purpose of the philosophy they meant to defend.

It may be objected, that I have taken no notice of Sir Isaac's system of the tides, which he explains by his grand principle of gravitation and attraction. But, if there be no such thing as gravitation in the celestial regions, as I have endeavoured to show, and, if we have no conception of body operating upon body by attraction, or any other way than in contact, it necessarily follows, that the movement of the tides must be accounted for, like every other movement that is not mechanical, from the immediate operation of mind. But it must be supposed, that the mind which moves the waters, will do it regularly, and in conformity to the motions of the moon, more or less, as she is nearer to, or farther from the waters; for, as I have observed above, it would be anomalous, and out of the order of nature, if two bodies, so related as the moon and our earth, the one surrounding, the other surrounded, should not have an influence upon one another, and a mutual sympathy.

and forces. But what is the cause of these motions, and what is the motive force, is an inquiry that belongs to philosophy, and to the first philosophy, whose subject is the universe, and the principle of all production and generation in it; an inquiry, for which the study of geometry and mechanism will not alone qualify any man.

Sir Isaac went still further out of his province, when he inquired concerning the origin of other motions which he observed among the smaller bodies, such as repulsion, magnetism, and electricity. In measuring those motions, he did not find that his geometry and mechanics could be of any use to him; he should, therefore, have either let them alone altogether, or, if he was to inquire concerning the cause of them, he should have ascribed them to mind, which, one should have thought, was most natural for a Theist, such as Sir Isaac certainly was, to have done, as they could not be accounted for from any mechanical cause.

But, instead of mind, he employs a *subtile spirit*, pervading all bodies, by which he accounts, not only for the attraction, cohesion, and repulsion of the small particles of matter, and for all the phaenomena of electricity, but for sensation, and the spontaneous motion of animals *. Now, this *subtile spirit* is more an *occult cause*

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His words are, Adjicere jam liceret nonnulla de spiritu quodam subtilissimo, corpora crassa pervadente, et in iisdem latente; cujus vi et actionibus particulae corporum ad minimas distantias se mutuo attrahunt, et contiguae factae cohaerent; et corpora electrica agunt ad distantias majores, tam repellendo quam attrahendo corpuscula vicina; et lux emittitur, reflectitur, refringitur, inflectitur, et corpora calefacit; et sensatio omnis excitatur, et membra animalium ad voluntatem moventur, vibrationibus, scilicet, hujus spiritus per solida nervorum capillamenta ab externis sensuum organibus ad cerebrum, et a cerebro in musculos, propagatis. Sed haec paucis exponi non possunt; neque adest sufficiens copia experimentorum, quibus leges actionum hujus spiritus accurate determinari et monstrari debent.—*In fine Principiorum.*

than any mentioned by Aristotle ; for Aristotle, when he speaks of *occult causes*, does not say what they are ; nor does he mean, as I have said, to conceal his ignorance, but to confess it ; whereas, Sir Isaac mentions the cause particularly, by calling it a *most subtile spirit*.

Now, in the *first* place, I deny that any such spirit exists, or that we can even conceive it to exist. And, indeed, I wonder that a philosophy, which professes to be founded upon the phaenomena of nature, and what falls under sense and observation, should suppose a material thing, which does not, like other matter, only occupy empty space, but pervades solid bodies, or should suppose bodies that could be penetrated in that way, that is, bodies without impenetrability or resistance. And, *2dly*, Sir Isaac has not shown, nor attempted to show, how this spirit, supposing it to exist, could perform the wonderful effects he ascribes to it, directing the motions of the bodies it pervades regularly and uniformly, and to a certain end and purpose. If mere matter, however subtile, can do this, I should desire to know the distinction betwixt *matter* and *mind*.

Sir Isaac, in this respect, puts me in mind of an ancient philosopher, Anaxagoras, who maintained, as Sir Isaac does, that mind was the cause of all things ; but, when he came to explain the particular phaenomena of nature, instead of having recourse to mind, employed airs and aethers, subtile spirits and fluids, and I know not what ; in short, any thing rather than *mind*—a cause which he admitted to exist in the universe—but, rather than employ it, had recourse to imaginary causes, of the existence of which he could give no proof*.

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* It was for this reason that Socrates, in the *Phaedo*, says he was so much disappointed in his hopes of being instructed by the philosophy of Anaxagoras : ' For,' says he, ' I was told that he made *mind* or *intellect* the cause of every thing in the universe ;

The Tragic poets, of old, when they could not otherwise untie the knot of their fable, brought down a God in a machine, who solved all difficulties; but such philosophers as Anaxagoras will not, even when they cannot do better, employ *mind* or Divinity.

Our philosophers, since Sir Isaac's time, have gone on in the same tract, and still, I think, farther; for their labour seems to be like that of the Epicureans of old, to account *quo quaque modo fiant opera sine Divum* †; and, tho' they do not, like those Atheistical philosophers, exclude the Divinity altogether from the system of nature, by placing him in certain extramundane spaces, they put him at the end of so long a chain of material causes, as to be almost quite out of sight; whereas, according to my philosophy, and the philosophy of the pious antients, *he is near to every one of us*, and in him, we, as well as every thing else, *live, move, and have our being*.

What greater length certain philosophers, both at home and abroad, have gone of late years, is very well known. Some of these philosophers use the name of Sir Isaac, and pretend to build their system upon his principles; but they abuse those principles most grossly, when they would, by arguments drawn from them, exclude the Deity altogether from the system of the universe; for, tho' Sir Isaac has no doubt made a machine of the heavens, it is evident that he believed the Deity to be the maker and contriver of this machine, and the first author of all its motions, and of all the motions in the universe, even of *gravitation*; for, though

verse; but, when I came to read his books, “*ἴσα ἀνδρα τῶ μιν ἢ οὐδὲν χρημίνον, οὐδὲ τίνας αἰτίας ἐκπαιτίζουσιν εἰς τὸ διακοσμεῖν τὰ πρᾶγματα, αἰέρας δὲ καὶ αἰθέρας καὶ ὕδατα αἰτιώμεν, καὶ ἄλλα πολλὰ καὶ ἄτοκα*”—*Editio Ficini*, p. 73. And Aristotle, in his *Metap.* lib. I. cap. 4. says, that Anaxagoras *μηχανὴν χρῆται τῇ ἡ, πρὸς τὴν κοσμοποιίαν* (alluding, no doubt, to the practice of the Tragic Poets mentioned above;) *καὶ ὅταν ἀπορῇ διὰ τίς αἰτίας, ἐξ ἀνάγκης ἔστι, τότε ἰλκεῖ αὐτόν. ἐν δὲ τοῖς ἄλλοις πάντα πολλοὶ αἰτιῶνται τῶν γινομένων, ἢ οὐκ.*

† Lucretius.

though he has not said so expressly in his *Principia*, and has thrown out some things there concerning the *attraction* and *repulsion* of small bodies; the phaenomena of electricity, sensation, and spontaneous motion, which, as I have observed, favour a good deal of *materialism*; he has, upon second thoughts, corrected that in the second edition of his *Optics*, in the last query, where he says, That the particles of matter are moved by *certain active principles*; which are the causes of gravitation, of magnetic and electric attractions, of fermentation, and the cohesion of bodies *. In this passage, he plainly distinguishes this *active principle* from the *matter* which it moves; and, therefore, has gone a step further than he has done in his *Principia*, where he has only said, that he does not affirm gravitation to be an essential property of *matter*; whereas, here, I think, he says expressly, that it is not, and that the *active principle*, which produces gravitation, is altogether distinct from *matter*; and, if so, I ask, what else it can be but *mind*? for, as there is nothing else in the universe but *matter* and *mind*, if it be not *matter*, it must be *mind*. Thus far, therefore, I have the pleasure to think, that I agree with Sir Isaac: And, if he likewise believed, as he seems to say, that this active principle in matter was necessary, not only for the beginning of motion, but for carrying it on †, then his philosophy, and the philosophy of the antients, which I have endeavoured to defend, are perfectly the same.

And here we may observe how much more consistently Sir Isaac Newton has spoken of the nature of *matter* than Mr Locke, who, after having defined *mind* to be *power active*, and body *power passive*, has said, that there is no contradiction in body thinking, and it may be so modified, as to have that quality ‡. But such an assertion is, as

* Second edit. of the *Optics*, p. 376. and 377.

† *Ibid.* p. 373.

‡ Locke's Essay, lib. 4. cap. 10. sect. 10. And cap. 3. sect. 6.

I have elfewhere obferved †, an abfolute contradiction; for it is as if he had laid, that the fame thing was effentially active, and effentially paffive, capable of beginning motion, and not capable of beginning motion; or, in other words, that the fame thing might be, and not be. Whereas, Sir Ifaac, holding faft by that fundamental principle of his philofophy, that *matter* is, by its nature and effence, altogether paffive, fo as to be incapable, either of beginning motion, or ftopping it when begun, lays it down, in this paffage of his Optics, that the active principle, which he fupposes to be in all particles of matter, is no modification of matter, but fomething altogether diftinct from it.

Upon the whole, there can only, I think, be three opinions upon this very important fubject, concerning the origin and continuation of motion; one or other of which muft neceffarily be the truth. The firft is, that the *power* of motion is effential to matter; or, in other words, that it moves itfelf. The fecond is, that, though it have not in itfelf a principle of motion, yet it may have fuch a principle impreffed upon it, and, in that way, may be not only put in motion, but continue in motion; fo that the bufinefs of the univerfe may be carried on by this firft original impreffion, without more. Or, laftly, that all the motions of the univerfe are not only begun, but are continually carried on, by the conftant agency of *mind*, or an immaterial power.

As to the firft of thefe opinions, which muft be the opinion of all the materialifts, who are not, like Epicurus and his followers, fo fenfelefs, as not to give fome account of the beginning and continuation of motion, I think I have demonftrated, that nothing can move itfelf, and that the moving principle, and the body moved, muft neceffarily be diftinct. On the other hand, the materialifts muft maintain, not only that body moves itfelf, but that it can ftop its own motion, and
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† Page 12.

rest of itself ; for, when a body coheres to another, and incorporates with it, so far it rests ; and, therefore, they must say that body has, in itself, and of its own nature, a principle of rest, as well as of motion. Now, this is not only not supported by any of the appearances of nature, but is directly contrary to them ; for it is proved by experiment, as well as by reasoning, that a body, once put in motion, continues to move, till, by some external force, or contrary impulse, it be stopped. —But, further, these philosophers must not only maintain, that body has, by its nature and essence, the power of moving itself, and ceasing to move, but, likewise, that it has the power of operating for a certain end, and using the most artificial means to attain that end. The consequence of which is, that, as these gentlemen acknowledge no intelligence in the universe, except their own, and as there necessarily must be somewhere intelligence, when any being acts for a certain end, and attains that end by the most proper means, it is evident that there must be in the *matter*, besides the power of motion and rest, *understanding* and *intelligence*. Now, if such suppositions are allowed, there is an end of all philosophy of fact and experiment ; and we may suppose *body*, or any thing else in nature, to be what we please.

The second hypothesis is that of Sir Isaac Newton ; by which he supposes that a certain force, impressed originally upon *matter*, will make it perform all the motions that are necessary for the system of the universe. In the passage above quoted, from the last query of his *Optics* *, he seems to say, that the active principle, which he supposes in all the particles of matter, is necessary, not only for putting bodies into motion, but for preserving and continuing their motion. But, in
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* Page 373.

another passage in the same Query *, he says, 'That, though the world could not rise out of chaos by the mere laws of nature, yet, being once formed, it may continue, by these laws, for many ages.' That is to say, as I understand the words, that the world, being once formed and set agoing, will go on of itself, by the force of mere *matter* and *mechanism*, according to certain laws of motion originally impressed upon it. Now, though the word *world* used here is broad enough to comprehend all things on this earth, animals and vegetables, as well as inanimate bodies, yet I am persuaded Sir Isaac had nothing in view but the system of the heavens, as it is explained in his *Principia*, where he undoubtedly makes a machine of the solar system. But, as I have observed, the system of Des Cartes, and the other French philosophers, who make a machine of animals and vegetables here on earth, as well as of the celestial bodies, is more consistent with itself, and more agreeable to the analogy that we observe in nature, than Sir Isaac's system. And, I think, we may fairly argue, that if, by virtue of the force originally impressed, the celestial bodies continue to move, all the bodies here on earth do likewise move in the same manner. But if, on the contrary, it be certain that not only organized bodies here on earth are not moved in that way, but even unorganized bodies, I think the conclusion will be fair on the other side. Now, that the brute animals are mere machines, nobody, I think, can seriously believe, who does not, at the same time, believe, that we ourselves are mere machines, and are only moved by impulses originally given us. Neither has it been hitherto attempted, as far as I know, to account in that way for the motion of the vegetable. And, even as to unorganized bodies, I think it is as impossible that they can perform all their various movements from any force originally impressed upon them. In this way, we might account for a stone falling to the ground once; but, how shall we account for its falling so a second, third, and innumera-

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* Page 378.

able times? In this way, we may account for the *aquafortis* once fastening upon iron, and dissolving it; but, when the *vis impressa* is this way exhausted, what account can we give of its leaving the iron, when a piece of *lapis calaminaris* is thrown into the *menstruum*, running to the *lapis calaminaris*, and dissolving it? and then, again, after it has dissolved silver, when a piece of copper is thrown into the solution, it lets go the silver and goes to it. The only effect we can conceive of any impulse given to body, is to move it in a straight line. Nor have we any idea of its moving in any other direction, except by a new impulse given it in another line. Far less have we any idea of the same original impulse continuing to make it move, after its motion is once stopped. If, therefore, these so various movements, and so often renewed, of the minute particles of bodies, can only be produced by an immaterial power constantly operating, I say the same of greater bodies, even of the celestial bodies; and, without forming hypotheses of gravitating and projectile forces, and of combined motions thence resulting, I say, as the antients said, that those bodies are moved, like any thing here on earth, by *mind*, guiding and governing their motions, not arbitrarily, or at random, but according to fixed and established laws. This is the opinion of Dr Clarke, in the passage above quoted*, where he rejects altogether the notion of matter's obeying any laws originally impressed upon it, and says, that it is moved by something superior to *matter*, *continually* exerting on it a certain force or power, according to certain and determinate laws. And, in another passage of the same work†, he says still more appositely to my present purpose, ‘ All things that are *done* in ‘ the world, are done either immediately by God himself, or by ‘ *created intelligent beings*: Matter being evidently not at all capable ‘ of any *laws* or *powers* whatsoever, any more than it is capable of ‘ intelligence, excepting only this one *negative power*, that every ‘ part

* Page 253.

† Evidence of Natural and Revealed Religion, page 300. fourth edition.

‘ part of it will, of itself, always and necessarily continue in that
 ‘ state, whether of rest or motion, wherein it at present is : So
 ‘ that all those things which we commonly say are the effects of the
 ‘ *natural powers* of matter, and *laws* of motion, of gravitation, at-
 ‘ traction, and the like, are indeed (if we will speak strictly and
 ‘ properly,) the effects of God’s acting upon matter continually and
 ‘ every moment, either immediately, by himself, or mediately, by
 ‘ some created intelligent beings.’

Thus, it appears, that this great scholar, philosopher, and divine, to whom both natural and revealed religion are so much obliged, though intimately connected with Sir Isaac, and very well acquainted with his philosophy, yet differs from him in this material point ; and, rejecting the notion of the heavens being a machine, moved by certain forces originally impressed upon the celestial bodies, asserts the perpetual and immediate agency of *mind* through the whole universe. And it is evident, from the passage first quoted, that he thought this an essential part of the doctrine of Theism, and that it is necessarily connected with the proof of the world’s being originally produced by a Supreme, Intelligent Cause ; and indeed it is so ; for, how can we demonstrate that *mind* is the origin of all motion in the universe, otherwise than by showing that mere matter and mechanism never could have produced it ? Now, in the same way, I prove, that, as motion cannot be begun, so neither can it be carried on without mind, either in the heavens, or on the earth.

C H A P. XX.

Chance numbered among the Causes of Things—Necessary to inquire what sort of a Cause it is—The common Opinion concerning Chance—A Thing not by accident, because we do not know the Cause of it—Examples of that in the Weather, Dice, and Cards—Chance refers to an End proposed by Nature or Man—Examples of this—Things happening besides that End not always fortuitous—Examples of this—Fortuitous, and by accident, not the same—Different Names given, in Greek, to what happens besides the End intended by Nature, and that which is intended by Man—Definition of Chance from the foregoing Investigation—Consequence of this Doctrine of Chance.

HAVING said so much of *causes* in general, and of *mind* in particular, before I conclude this Book, I will give some account of one cause hitherto not mentioned, but which, by certain philosophers, is thought the cause of every thing in the universe, and, by almost every body, is held to be the cause of very many things that daily happen, and particularly in human life; I mean *chance*. And it will not appear unconnected with *mind*, which I have insisted so much upon, if it be true, as I think it is, what Aristotle says, that chance necessarily supposes *mind*, which is first in the order of things, and chance only an accessory to it; for Aristotle, among many other things that he has added to philosophy, is the first, as far as I know, who has given any rational and philosophical account of what is called

called *chance*, or *fortune*. This he has done in the second book of his *Physics* ; but, as he writes shortly, and often obscurely, I will endeavour to explain his doctrine to the English reader, with some additions to it, which I think it is necessary to make.

And I will begin, as Aristotle has done, with stating what is commonly said concerning *chance* or *fortune* ; and, by examining what is right, and what is wrong, in what is so said, we may, perhaps, come to the truth.

In the *first* place, it is commonly said, that what happens by chance or accident, or fortuitously, (for we use all these words as synonymous,) happens *rarely* : And this is rightly said ; for, whatever happens commonly, and in the ordinary course of things, is not a fortuitous event, because we foresee and expect it ; whereas, what happens by chance or accident, is always unforeseen, and unexpected.

But, because fortuitous events are rare, we ought not from thence to conclude that rare events are fortuitous ; for, if that were so, then earthquakes, inundations, eclipses, would be fortuitous events : But these were never accounted fortuitous, even in the ages of the greatest ignorance, but were believed to be the immediate work of God. Of eclipses, we now know the cause with so great certainty, that we calculate, to a minute, when they are to happen ; and, though we are not so sure of the causes of earthquakes and inundations, nor, suppose we were sure of the causes, do we know the operation of them with such certainty, as to be able to foretel those events ; yet the philosopher knows, that they proceed from natural causes, operating as regularly as those which produce the most common events.

But, the most common use, I believe, of the word *chance* is, to denote an event that is not produced by a certain and determinate cause, or such

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an event as may be, or may not be produced by any cause. But the philosopher knows that every thing is not only produced by some cause, but by a fixed and determinate cause, that is, by a cause which has a natural tendency to produce that effect, and which operates regularly for that purpose. But these causes we very often do not know ; and therefore we speak of the events produced by them as uncertain, and say, that they happen by *accident*.

In this way we apply the word *accident*, when we say, that, ' By accident, it was a bad day yesterday, but it may happen to be a good day to-morrow.' This is speaking unphilosophically and improperly ; because all such events are produced by causes as certain and determinate as any other thing in nature, though we do not know them, at least, cannot combine them, and calculate their effects ; for we know, in general, that the changes of the weather are produced by certain changes in our atmosphere ; and we know further, that the changes in the atmosphere are produced by several different causes, all operating regularly and uniformly ; which causes though we may be able to enumerate, yet we cannot explain how, and in what degree, each of them operates. For the same reason, it is a common impropriety of speech, that the cast of a dye, or a good or bad hand at cards, is a matter of chance ; because these events depend upon causes as certain as the weather, and known to us pretty much in the same way ; for we know, in general, that it is the motion given to the dye, when it is shaken and thrown out of the box, that produces the cast, as it is the shuffling and cutting the cards that makes the hand such as it is. But, though we know that these are the causes of those events, yet we cannot tell how they operate, or by what steps and progress of intermediate causes they produce these effects.

It is not, therefore, our ignorance of causes that makes *chance* ; for we often dispute about the causes of things that are most certain in their

their event, and happen every day. Thus, the rising and setting of the sun some ascribe to material causes ; others to *mind*, as I do ; and some divide the matter betwixt *mind* and material necessity. Besides, if *chance* depended merely upon our apprehensions of things, and the greater or less extent or certainty of our knowledge, it would have no foundation in nature ; and, therefore, to treat of it, would not belong either to the natural philosopher, or the metaphysician, but to those arts whose subjects are the opinions of men.

And here the matter appears to be more involved than ever, and the reader may say, that, instead of clearing it up, I have only puzzled and perplexed it ; for, if what happens commonly is not *chance*—if neither, what happens rarely, is not always *chance*—if what is produced by fixed and determinate causes, is likewise not *chance*—and, if every thing in nature is so produced—and, if even our ignorance of those causes will not make the event fortuitous—What then is *fortune* or *chance* ? It appears to be nothing but a name ; and this great Goddess, whom all the world adores, and to whom so many temples, and altars have been reared, is nothing but a mere phantom of the imagination.

And it would be so, if nature and man never produced any thing but what they intended ; for we are to remember, that mind, according to my system, produces every thing in the world, either acting without choice or deliberation, and without intelligence, which is what I call *Nature*, or, with choice, deliberation, and intelligence, which is what I call *Man*.

And here begins to appear the solution of the difficulty ; for, it is evident, that many things happen, besides what man intends or proposes ; and, also, some things happen different from what we know is aimed at by Nature.

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Now, what name shall we give to those things? We cannot call them natural things, or from nature—neither can we say that they are from human intention. They are, therefore, what we call *fortuitous events*: And the cause that produces them is what is called *chance*. But, it is evident that they all have a respect to some end proposed by Nature or by man: So that nothing is more true than what Aristotle says, that, if there were no end intended, there could be no chance*.

To begin with the intention of man—A man digs a piece of ground, with an intention either to sow or plant it; but, in digging, he finds a treasure. This is beside his intention, and therefore is said to be *chance*. Again, a man goes to the market-place, to purchase something that he wants, and he meets a friend whom he did not expect to see, and believed to be at a great distance: This, likewise, being a thing different from the intention of the man, is called *chance*: And it will not be the less *chance*, that the man does, at the same time, what he intended to do, viz. purchasing what he wanted, as the man, in the other case, digs the ground which he intended to dig; for, all that is necessary to make *chance*, is, that something should happen *besides* what is intended, whether what is intended happen or not.

This is *chance*, with respect to *man*. What we call chance in Nature depends entirely upon what we call *final causes*. That there are such in every operation of nature, nobody who is not an Atheist, and an Atheist of the most absurd kind, can doubt. But these ends are, to us, often not known; and, therefore, we may be often mistaken

* In the fifth chapter of the second book of his *Physics*, he tells us, that chance belongs to the things that are *ἔκτα του*—*ἔστι δὲ ἔκτα του ὅσα τὰ ἀπὸ διανοίας καὶ πράξεως, καὶ ὅσα ἀπὸ φύσεως*. 'What is done for an end, proceeds either from understanding or from Nature.'

ken in pronouncing, that any natural event is from *chance*, as we sometimes are in thinking that events of human life are from *chance*, whilst they are truly from intention. But there are natural events, that, we know with great certainty, are besides the end proposed by nature. Thus, for example, when a hanging wall falls upon a passenger, and crushes him, the destination of Nature was only, that the stones of the wall, being no longer kept together by the cement, should fall to the ground, according to their natural movement ; so that the crushing of the man was something that happened besides the purpose of Nature. Again, the end proposed by Nature, in the copulation of animals, is, that they should produce an animal of the same species, with the form, and all the members and parts belonging to animals of that species. But, if an animal of another species is produced, or, if it be what is called a *monster*, the production is acknowledged by every body to be *besides Nature*, or *παρὰ φύσιν*, as the Greeks express it. And this is properly said : But it is not so proper to say, that it is contrary to Nature ; for, though many things happen contrary to the intention of *man*, whose power is so much limited, nothing can be properly said to happen contrary to the destination of Nature.

For understanding of this, the reader will be pleased to recollect what I said before, that every thing in the universe is produced by fixed and determinate causes, operating regularly for a certain purpose. Whatever, therefore, in the case last mentioned, hinders the natural production of an animal, and distorts or disfigures it, acts as regularly, and with as certain a destination, as the causes which promote a natural birth ; so that, in some sense, even a monster may be said to be natural. In like manner, though a thing happen *besides* the intention, or even contrary to the intention of a man, it will be according to the destination of Nature, or intention of some other man. Thus, in the example above given, when I go to the market-place to purchase any thing, and see a friend that I did not expect to see, or, perhaps, an enemy,

enemy, that I neither expected nor wished to see ; though this happen *besides* or contrary to *my* intention, it is *according* to the intention of the person I meet, who comes to the market-place for some purpose or other. Again, in the case of a man digging and finding a treasure, tho' the treasure was found *besides* the intention of the digger, it was put there *according* to the intention of the person who hid it. Further, in the case of a passenger being crushed by the fall of a wall, though this event was *besides* the destination of Nature, it was according to the intention of the person crushed, not that he intended to be crushed, but that it was by intention he walked along the side of the wall.

And here we may perceive something in this matter that seems to have escaped even Aristotle. And it is this, that, whenever any thing happens by accident, there must necessarily be a concurrence of two causes to produce the effect ; either both from nature, as in the case of the monstrous birth, or both from man, as in the case of finding the treasure, or meeting accidentally with a friend ; or, one from Nature, and the other from man, as in the case of the passenger oppressed by the fall of the wall. The chance, therefore, is in the concurrence of the two causes, not in any one of them taken separately ; for, in that way, they operate each of them in a natural and ordinary way. And it is in this way, that *chance* and *necessity*, which, in their nature, appear to be diametrically opposite, are to be reconciled ; for all the operations of Nature, taken separately, are necessary : But, when they concur to produce an event which otherwise could not have happened, that event is what is called *chance*. In like manner, what proceeds from will and intention, is also necessary in a certain sense, as a person cannot act otherwise than according to the last determination of his will : But it is a necessity of a quite different kind from material or natural necessity, as shall, in the next chapter, be more particularly explain-

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ed. Each, therefore, of the several intentions of man, in the instances above given, may be said, in some sense, to be necessary ; and most certainly they are not fortuitous ; but it is the concurrence of the two intentions to produce an event, intended, perhaps, by neither of the men, and certainly not by one, which makes that event fortuitous.

By these distinctions, it might be thought that this subject was exhausted ; but the variety of Nature is not so soon exhausted ; and there still remains one distinction more to be made ; for, let us suppose that the concurrence of the two causes, which produce the event, is necessary, and in the ordinary course of things ; I say the event, in that case, is not fortuitous. My meaning will be best explained by an example or two. Suppose I take a long and a quick journey, for some purpose or another ; the necessary consequence of such a journey is fatigue. Here, therefore, are two causes ; the one the intention of man, which produces the journey, the other, the operation of Nature upon my body, in consequence of the exercise. In this manner, two causes concurring, the one intentional, and the other natural, produce the fatigue. But, though this production be besides my intention, yet, as it is the necessary consequence of my intention that it should be produced, it is not a fortuitous event.

This example is mixed of the intention of man, and the destination of Nature ; but I will give another, which is entirely from Nature, and which is furnished me by Aristotle. The decline and old age of man is an event proposed by Nature ; but, that he should become gray when he grows old, is not proposed by Nature. Yet, as it always happens, and is the necessary consequence of his growing old by the decay of moisture at that time of life, it is not a fortuitous event, though it be besides the intention of Nature, as the fatigue of the journey was besides the intention of the person who made it. I am persuaded many other examples of the same kind might be collected by a diligent observer

server of Nature : And I believe it is the true account to be given of what Buffon calls excrescent parts in animals, such as the breasts and nipples of men, which are of no use in themselves, but are the necessary consequences of other parts that are of use, or of the whole frame and structure of the animal.

Thus, it appears evident, that *chance* is no more but a secondary cause, dependent entirely upon mind and intention ; and not upon one intention, as we have seen, but upon two. It is therefore clearly, as Aristotle has said, no more than an accessory of mind. Aristotle calls it a cause *κατὰ συμβεβηκός*, or *by accident* *. And it is true, whatever is produced by chance, is *κατὰ συμβεβηκός* : But, whatever is *κατὰ συμβεβηκός*, is not therefore *chance* ; as, in the case above mentioned, the fatigue of the journey, and the grayness of old age, are both *κατὰ συμβεβηκός*, being secondary events, not intended by man or Nature ; yet they are not fortuitous, being the necessary consequence of what was intended. Therefore Milton has said very properly, as I mentioned before †, that, when Sampson pulled down the house, he killed the Lords of the Philistines, and, by *accident*, himself ; for, as his intention was to kill the Lords of the Philistines, his killing himself was *κατὰ συμβεβηκός*, or *by accident* ; but it would have been very improper to have said, that it was fortuitously, or by *chance*.

Aristotle has not only distinguished, as I have done, betwixt the two cases, when the event happens *besides* the intention of man, and when it happens *besides* the end proposed by Nature ; but he has given different names to the two events, which it seems his language afforded, but which, I think, ours does not. The former he calls

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* Aristotle, *Phyf. lib. 2. cap. 5.*

† P. 39.

τυχη, and the other *αυτοματον* *. But both, he says, are fortuitous and secondary, or an appendix to *intention* or Nature.

Thus, I conclude my investigation of this subject, which was not understood before Aristotle wrote, nor, I believe, by any body since his time, who has not read him. And, from this investigation, it appears, that '*Chance* is a rare event, produced by the concurrence of two causes, both from Nature; or both from the intention of man; or one from each; but the concurrence of the two causes not necessary, or in the ordinary course of things, and the event produced *besides* the destination of *Nature*, or intention of *Man*.'

Thus, I think, I have clearly made out, that *chance* is not a mere phantom or creature of our imagination, but that it has a real existence in nature, as real as mind, to which it is an appendix. And the consequence of this doctrine is what Aristotle has said, that, even if we should allow *chance* to have produced this universe, it necessarily supposes intelligence and Nature pre-existent †. Philosophers, therefore, of modern times, who exclude *mind* from the system of Nature, speak most absurdly, and without knowing what they say, when they speak of *chance* making a world, and carrying it on; for, instead of *chance*, if they understood their own system, they would say that it was *material necessity* that first produced, and still preserves the world; or, in other words, that there are certain powers in matter, by which it acts without *mind* or *intelligence*, or any *end proposed*, and consequently *necessarily*; which powers, operating in this way, have not only produced this wonderful frame of the universe, but sustain and preserve it ‡. How they account for blind necessity producing such

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* Ibid. *in fine*

† Arist. lib. 2. cap 6.

‡ This is the system of Epicurus and his followers, to whom the absurdity of making Chance produce every thing, when, at the same time, they excluded mind and intel-

wonderful effects, let them consider; but this *necessity* is truly their system, not *chance*. And they are so far in the right, that all the motions of nature, which are not from choice or deliberation, may be said to be necessary. And, accordingly, whatever can be accounted for in Nature from mechanical causes, is necessary, and, I think, well accounted for. But their system, as I already have observed, is defective in these two capital points; first, that they do not show how motion should ever have begun in the universe; nor, secondly, how such wonderful ends should have been accomplished by such wonderful means, without any ends proposed, or means contrived; that is, in one word, without intelligence.

Before I conclude this chapter, it is proper to observe, that the terms *necessary* and *contingent*, (*αναγκασιον και ενδεχομενον*) so much used, not only in the books of both antient and modern philosophy, but in common discourse, are to be understood in a sense very different from *the necessity* and *chance* of which I have been here treating; for these have, as I have shown, a real existence in nature; whereas the other are only relative to our knowledge and apprehension, and therefore belong not to

intelligence from the universe, has been falsely imputed by some modern philosophers; for, it is evident that Epicurus's system, as explained by Lucretius, is a system of materialism, accounting for the production of every thing from the powers of the different particles of matter, of various sizes and figures, impelling one another, sometimes joining together, sometimes separating, and, in that way, exhibiting all the different forms and motions we see in the universe. Neither does he say, that the motion of the atoms, which was the cause of all these various impulses, concretions, and secretions, was produced by chance: But he tells us, that the atoms, by their gravity, fall downwards, and, having got a small oblique inclination, (*parvum clinamen principium*, as Lucretius calls it,) he does not say by chance, though he does not tell us how, they meet and jostle, and produce all the effects above mentioned. And, so far is chance from being predominant in Epicurus's system, that it was absolutely excluded in all natural events; for, as there was no distinction, according to him, or end proposed, in any of the operations of Nature, nothing could happen *besides* that end; that is, nothing could happen *by chance*.

to the nature of things, but the opinions of men. In this sense we say, that a thing is *necessary*, which happens constantly and regularly, without one instance to the contrary. Of this kind is the descent of heavy bodies, the ascent of flame, the rising or setting of the sun; for these things, we know from experience, happen constantly and uniformly: And, it is by experience and induction only, not *a priori*, that we know any thing of the qualities of natural things; and therefore these events are *necessary* in a sense very different from that in which we say that the theorems of science are *necessary truths*. *Contingent*, on the other hand, is that which does not happen constantly and regularly. Of this kind antient philosophy has distinguished three different specieses; for either the event happens more frequently one way than another, and then it is said to be *πρὸς τὸ πλεον*; of this kind are the regular productions of nature, and the ordinary actions of men: Or it happens more rarely, such as the birth of monsters, or other extraordinary productions of nature, and many accidents that happen to man: Or, *lastly*, it is betwixt the two, and happens as often the one way as the other; or, as they express it in Greek, *ἰσότης ἐντυχῇ*. Of this kind are some things in nature, such as the birth of a male or female child; a good or bad day in some climates of the earth; and many things among men, such as good or bad luck at play. All these last mentioned events are in reality as necessary as those first mentioned, such as the falling of heavy bodies, &c. But, as they do not happen constantly and uniformly, and, as we cannot account for their happening sometimes one way and sometimes another, we say they are *contingent*.

C H A P. XXI.

No Dispute among the Antient Philosophers concerning Free-will and Necessity—Reason of this—The Distinction betwixt Sense and Intellect necessary to be made for understanding this matter—Definition of Will—Will and Free-will the same—Difference betwixt Will and material Necessity in Bodies unorganised, and in Vegetables—betwixt Will and Instinct in Brutes—What constitutes a free Agent—Where Reason is most perfect, there is the greatest Freedom—In what Sense Will is necessary, as well as free—Necessity of Will essential to its nature—Every thing necessary in that Sense—A Cause for every thing, and every Cause must produce its Effect—Moral necessity even stronger than natural—Doctor Clarke's Opinion in this matter—The Opinion of a late Writer of Essays on the same Subject.

HAVING mentioned, in the preceding chapter, *material necessity* and *will*, as things opposite, and having also spoken of *will*, as *necessary* likewise in some respect, I think it belongs to the theory of mind to explain this matter a little further.

Till I was better acquainted with the antient philosophy, I have often wondered, why there was nothing said in the books of Plato and Aristotle, nor in any of the writings of the philosophers of that age, or of any preceding age, as far as I know, upon a question that has been so much agitated in later times, concerning *free will* and *necessity* in human

human actions. But, when I had acquired more knowledge in that philosophy, and found that they had distinguished accurately betwixt *sense* and *intellect*, *sensations* and *ideas*, *instinct* and *opinion*, *appetite* and *will*, I soon discovered the reason why there was no dispute among them, upon a question about which so many volumes have been written in modern times, and to so little purpose ; for, I maintain, that, if the things I just now mentioned are well defined, and carefully distinguished one from another, there can be no dispute upon the subject, not even among the vulgar, far less among philosophers. And, however paradoxical, at first sight, it may seem, I despair not to make it evident to common apprehension, that all *will* is *free-will* ; and that, at the same time, it is *necessary*, but of a *necessity* very different from *material* or *physical* necessity.

I do not, however, pretend to make this doctrine intelligible to those who have not learned to distinguish two faculties of the mind so different as *sense* and *intellect*, and who consequently confound *sensations* and *ideas*, making no difference betwixt them, but what a late philosopher has thought proper to make, viz. that the former is a *stronger*, the latter a *weaker impression* upon the mind ; so that they differ only in degree, not in kind. This philosophy, if it may be called such, not only takes away all distinction betwixt the sensitive and intellectual part of our nature, and has many other bad consequences, of which I have taken notice elsewhere ; but it puts an end to all *science* of the human *mind* ; for, where there is no distinction of kind, but only degrees of *quality* of things of the same kind, of which it is impossible there can be any certain measure or standard, there no science can be*.

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* The reason why *quantity*, whether continuous or discrete, though it be but an *accident* or *property* of substance, is a subject of science, is, that each kind of it furnishes a standard or measure for itself. Thus *extension*, which is quantity continuous, can

This distinction being admitted, I define *will* to be 'the determination of intellect, to *act*, or not to *act*;' but, as we cannot conceive intellect to be determined, except by some motive, in order to make the definition compleat, we must say of what kind the motive is which determines intellect: And I say it is *good*, real, or apparent; for, betwixt these two, there is no difference in this argument. Now, good is neither a perception of sense, nor an image of such perception in the phantasia, (for with these intellect is not conversant); but it is an idea, and often a very complex idea, comprehending what is pleasant, what is beautiful or handsome; also, what is profitable to ourselves or others, to our friends, to our country, and even to all mankind.

And here we may perceive, that *will*, by its nature and essence, must be free in this respect, that its determinations are all from within; for, whatever influence external circumstances may have upon our *will*, however we may be allured by pleasure, or overcome by pain, still it is the intellect itself which determines itself, according to its apprehensions of *good* or *ill* in things*. Freedom, therefore, in this sense, being essential to *will*, *will* and *free-will* are terms absolutely

can be measured by any part of itself; and, in like manner, *number*, which is quantity discrete, can be measured by *number* or by *unit*; whereas *qualities*, such as *hot* and *cold*, *black* and *white*, *hard* and *soft*, &c. have no common measure, and therefore cannot be scientifically compared together; for which reason, as Aristotle has observed, in the chapter of his Categories concerning *Quality*, it is only of *quantity* that we say, *That it is equal or unequal*, ἴσος καὶ ἀνίσος: whereas, to qualities, we can only apply the term ἔτερον καὶ μᾶλλον that is, *more or less*. For the same reason, he might have said, there can be no *ratios* or proportions of qualities; for we cannot say of them, as we can say of quantities, that the one is a *half* or a *third* of the other.

* When the mind, contrary to its inclination, is determined to do any thing, that mixture of choice and necessity is, I think, well expressed by Homer, when he says that a person did the thing,

——— ἰκάν, αἰχρίει δὲ θυμῷ.

folutely fynonymous ; and the addition or epithet of *free* to *will* is altogether fuperfluous. Accordingly, in the Greek language, it is never added ; and, though we have tranflated the expreffion into Latin, and fay, *liberum arbitrium*, I do not remember that Cicero, or any Latin writer upon philofophy in that age, uſes ſuch an expreffion.

We ſhall underſtand better the nature of *will*, and that eſſential freedom which belongs to it, when we compare it with the operations of matter unorganized, or organized, that is, the vegetable and ſenſitive natures.

And firſt, as to unorganized matter, it is moved, as we have ſeen, either by an internal principle, which is what I call *Nature*, or by external impuſe ; and, in both caſes, it is moved in one uniform direction, without any thing like ſenſe, underſtanding, choice, or deliberation ; and therefore, as it cannot, by any act of its own, or by any power from within, alter, in the leaſt, its motion or direction, I ſay it is neceſſarily moved. And this neceſſity is what I call *material* or *phyſical neceſſity*.

Of the ſame kind is the movement of the vegetable ; which, though more various, is equally neceſſary.

The movement of the animal is ſtill more various ; and, as he has *ſenſes* and a *phantafia*, purſues certain ends and purpoſes, and often deliberates which of two things he ſhould do, it is a matter of more nice diſcrimination to diſtinguiſh the *impulſes*, by which he acts, from *will* : Nor, indeed, is it poſſible, without accurately making the diſtinction betwixt *ſenſe* and *intellect*, *appetite* and *will* ; for the brute, though he has ſenſes and appetites, which direct him to certain objects, has no intellect, and conſequently no idea of what is *good* or *ill*, and therefore no *will* ; and, though he ſometimes deliberates, it is only whether he

shall follow this or that impulse of appetite, not concerning what is *good* or *ill*.

The brute, therefore, as he has no *will*, must act necessarily; for there is no medium betwixt these two. But it is a *necessity* of a different kind from what I call *material necessity*; for his movements are spontaneous, proceeding from appetite and desire, which is not to be found in unorganized matter, nor even in the vegetable, which, therefore, has no spontaneity. But, as these appetites and desires do not arise from any opinions that he has formed, like our desires, and therefore are not from himself, but are given him by Superior Wisdom for the preservation of the individual and continuation of the kind, and are such that he must necessarily be led by them, his actions, therefore, are also necessary; but it is a necessity which ought not to be called *material necessity*, but rather *divine necessity*; the nature of which, I shall, in the sequel, explain.

But, though the movements of the brute be necessary, we are not from thence to conclude, as the Cartesians do, that the brute is a mere machine; for a machine is that which has its moving principle from without; whereas the moving principle of the brute is internal, and a part of himself, though, in its movements, it be directed by an intelligence not belonging to him.

From this account of *will*, and the actions which result from it, compared with the operations of the brute, the vegetable and unorganized matter, it is evident that there can be no *will* but where there are ideas, and a comparison of those ideas; from which comparison there arises the proposition, that such a thing is good, or such a thing is ill; therefore it ought to be done or not done: And, whatever animal cannot reason and form propositions of that kind, has not *will*. But the moving principle must be either those appetites or desires of the
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brute above mentioned, which are commonly known by the name of *instinct*; or, it must be a more simple principle still, without sense, appetites, or desires, and without pain or pleasure. Such is the moving principle in the vegetable, and in all unorganized bodies.

And here we may see what it is that constitutes a *free agent*. It is being governed by reason, and determined in all our actions and pursuits by notions of what is *good* or *ill*. When, therefore, at any time, we are led to do a thing from mere appetite or passion, without considering whether it be *good* or *ill*, we cannot then be said, with propriety, to *will* what we do; but we act like the brute, by an impulse altogether irrational, and worse than the brute in this respect, that his impulses are directed by Superior Wisdom, ours too often by vicious habits that we have contracted.

The more perfect our reason is, the more perfect our liberty or freedom; and, where reason is absolutely perfect, there liberty is most perfect. The Deity, is, therefore, of all agents, the most free; whereas man, though he be no doubt a free agent, as often as he acts with choice and deliberation, and according to what he thinks reasonable; yet, if his reason be disturbed by passion, if it be weak and infirm, or rash and presumptuous, his freedom is far from being perfect, and he is not improperly said to be a slave to those follies and passions, which, under the appearance of reason, mislead him: But still, as his motives are from within, and his actions the result of that determination of the understanding, called *will*, they are *voluntary* actions; which cannot be said properly of any action of the brute.

But, though the will of man be essentially free, his actions are not always so; for, though we be free to *will*, we are often not free to act according to our *will*; and it is only the Deity, with whom, to *will* and to *act*, is the same thing.

Thus,

Thus, it appears that *liberty* is so much of the essence of *will*, that those actions only which proceed from *will* are *voluntary* and *free* actions. And therefore, those who speak of *will* being moved or determined in the same manner as *body* is moved by external force, do not understand what they say; for, as *will* must be determined from within, and of itself, it is the same thing as if they said, that *will* is not *will*.

But, is not the *will* necessarily determined by what appears to intellect to be the best reason? It no doubt is so; nor is it possible to conceive any creature *willing* what he does not think best. But this is improperly called *necessity*; for *necessity* is always from without, and cannot be without two things; an *agent*, who applies force or violence, and a *patient* who suffers it. Nothing, therefore, can force itself: So that, when we say, that the intellect is necessarily determined by the strongest reason, we can mean nothing, but that necessity, which is in the nature of every thing, and is the same by which a triangle, or any other geometrical figure, has all the properties belonging to its nature.

The necessity, therefore, which is ascribed to *will*, is no other than that necessity, by which every thing is what it is. And in this sense, not only every thing in nature is necessary, but the great Author of Nature himself is necessary, both in his existence and in his attributes, and particularly with regard to his *will*; for it is admitted by all philosophers and divines, that the Deity must, of necessity, always *will* and *do* what is best: And this necessity is essential to his nature, resulting from his perfect wisdom and goodness. The necessity of the *will* of man is so far of the same kind, that it is internal, and arising entirely from the agent himself: But he differs in this important respect, that the *Divine Will* is necessarily determined by the most perfect wisdom and goodness, without inquiry
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or deliberation, and without any possibility of error ; whereas the human intellect inquires and deliberates, looks before and behind, tries to foresee consequences, and to discover effects in their causes : And, as his intellectual faculties are but weak, and very often disturbed by passion, in such searches and inquiries he is very liable to error.

But this internal necessity, in the case of both God and man, is very different from that external impulse which makes *body* necessarily move in a certain direction, or even from that internal principle of movement which moves *body*, but without knowledge, intelligence, or consciousness, of what it does.

This doctrine of the necessity of the *will*, I know, is a doctrine of hard digestion with many divines and philosophers ; but I would ask those philosophers and divines this simple question, Whether the greater good, real or apparent, be not the cause of the determination of the will ? Their answer, no doubt, will be, That it is a cause, but not a necessary cause. I ask, again, What they mean by a cause not necessary ? To which, I think, their answer must be, that a *cause* not necessary is that which produces the *effect* sometimes, but not always.—But every thing must be produced by some cause ; and, if the motive of the greater good is at any time not the cause of the determination of the will, I ask, What is the cause ? To this question, I believe, it is beyond the power of man to give an answer : So that the argument comes to this, that the motive of the greater good is the cause of the determination of the *will*, but not always ; and, when it is not the cause, no other cause can be assigned. Now, if I assign a cause which is admitted to be such, and if no other cause can be assigned, it must be held to be the only cause. If it be said that *chance* may be the cause of the determination of the *will*, I have shown, in the preceeding chapter, that what is the effect of *chance* is produced by as necessary causes as any thing else in Nature ; and, that
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it is not the uncertainty of the cause, but that it is the concurrence of two causes, both operating necessarily, which makes *chance*. If, by *chance*, is meant what I believe is the vulgar sense of the word, an event which may or may not be produced by any cause, my answer is, that there is no such thing in Nature as *chance* in this sense of the word, every thing being necessarily produced by some determinate cause, and nothing being a *cause* which does not produce its *effect*. Even the Materialists of old, such as Epicurus, did not say that any thing was produced by chance of this kind, (though I know it is commonly understood otherwise,) but by material necessity; and, indeed, to maintain that any thing is produced by such chance, is to give up the whole system of nature, and puts an end, at once, to all philosophy upon the subject.

And this necessity of *will*, I apprehend to be so much stronger than *material* necessity, that the latter may, by the act of the Deity, be suspended, at least, for a time. A stone, for example, may be suspended in the air, without that stone being annihilated, or even the motion of the celestial bodies we might conceive stop for a while, and yet those bodies still continue to exist *. But we could not conceive this mental

* Such things are commonly called *miracles*, and are much ridiculed by our free-thinkers, who say that they are, by *Nature*, impossible, and cannot be believed to happen, [except by ignorance and superstition. But, if Nature be what I have defined it, viz. mind without intelligence acting in body, or upon body, there is no absurdity in supposing that this mind should not only act in its ordinary and regular course, but sometimes in an extraordinary manner, under the controul and direction of intelligence, supreme or subordinate. We every day experience, that, by our small share of intelligence and animal force, we are able to controul the powers of Nature in some degree; and it is just as easy to conceive how the same thing may be done, in a much greater degree, by a greater power or intelligence. If man can suspend in the air a weight of 100 tons, Why may not an angel suspend one of 100,000? If we can stop or divert the course of great rivers here upon earth, Why may

tal necessity to cease, and yet the intellectual mind continue to exist ; for it is impossible, as I said, to conceive intellect determining itself to act, while it continues to be intellect, otherwise than by the motive of the greatest good.

At the same time, I would not be understood to deny, that the human intellect may be, and very often is, influenced in its determinations, by superior minds ; but it is in a way which preserves both the freedom and necessity of the *will*, according to the explanation that I have given of them ; for those superior minds influence the human only by suggesting motives of action to them, which otherwise would not occur : And in this way the freedom of our *will* is preserved. And I am persuaded it often happens, that our wills are determined by motives that come from whence we do not know. And it is in this way chiefly, according to my apprehension, that Providence directs and governs the affairs of men *. But the question is not, from

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may not mind, very much superior to man, stop even the course of a planet ? On this occasion, I will quote the words of Dr Clarke : ‘ There is no such thing as what * men commonly call the *course of nature*, or the *power of nature*. The course of nature, truly and properly speaking, is nothing else but the *will of God* producing * certain effects in a continued, regular, constant, and uniform manner : Which * course, or manner of acting, being, in every movement, perfectly *arbitrary*, is as * easy to be *altered*, at any time, as to be *preserved*. And if (as seems most probable) * this continual acting upon matter be performed by the subserviency of created intelligences appointed to that purpose by the Supreme Creator ; then it is as easy for * any of them, and as much within their natural power (by the permission of God) to * *alter* the course of Nature at any time, or in any respect, as it is to *preserve* or * *continue* it.’ Evidences of Natural and Revealed Religion, page 300. 4th edition.

Here the reader will observe, that the Doctor thinks it probable that the business of Nature is carried on by subordinate minds continually acting upon matter, which is just my system.

* It is therefore, I think, a very probable fiction of the poets, when they tell us, that such or such a counsel was suggested to their hero, by some God or superior power.

whence the motives come that influence our will, but whether they do it necessarily or not? Now, I say, that motives, from whencesoever they come, or however suggested, do necessarily determine the will; nor is it possible to conceive it otherwise determined.

In this doctrine of *free will* and *necessity*, I am glad to find, that I agree, in the main, with that great metaphysician, whom I have so often quoted, Dr Samuel Clarke, in his remarks on a book entitled, ‘*A Philosophical Enquiry into Human Liberty*.’ He maintains, as I do, that *will* is, by its nature and essence, *free*, and that it is a contradiction in terms to suppose an action proceeding from *will*, that is a *voluntary* action, not to be *free*. As to *necessity*, he makes a distinction betwixt the judgment of the mind, the resolution to act, and consequent action. In judgment, he says, the mind is passive, and is as necessarily determined by what appears the better reason, and the weightier motive, as the scale of the balance is weighed down by the greater weight. But, with regard to resolution and action, the mind is active, not passive; and, for that reason, there can be no necessity in the case. But this appears to me to be a distinction without a difference; for the mind is active in all its operations, as much when it assents to any proposition, as when it resolves and acts in consequence of that assent; for action and energy are of the essence of mind. The Supreme Mind we can have no conception of, without constant and un-
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power. Thus, *Homer*, in the beginning of the *Iliad*, tells us, that Juno inspired *Achilles* with the thought of calling an assembly of the Greeks, to deliberate how the plague was to be stopped:

Τῇ γὰρ ἐπεὶ φέρεται θῆκε Θεία Λευκωλίδος Ἥρη.

In the same manner, *Aeneas*, in the 12th *Aeneid*, is inspired by his mother with the thought of attacking the city of Laurentum:

Hic mentem Aeneae genetrix pulcherrima misit,
Nec ut ad muros, urbique adverteret agmen.

ceasing energy ; and even the human mind partakes so far of Divinity, as to be constantly active. Further, I say that the action of every mind is, by its nature and essence, determined in a certain way, so that it cannot act otherwise ; which is saying no more than, that every thing must act according to its nature. And, indeed, it is impossible to conceive how any thing should act in another manner. That the mind of the Deity is always necessarily determined both to *will* and to *do* what is best, is, as I have observed, admitted by all philosophers and divines ; the reason of which is no other than, that his nature is unchangeable and invariably such ; and he must necessarily act according to his nature. And, for the same reason, man must act according to what seems to him best ; for that is his nature. These positions, if they had been fairly stated to the Doctor, I am persuaded he would have agreed to. Nor would he, I believe, have denied that our resolutions and actions, though voluntary, are the necessary consequence of the judgment of the mind : So that I am persuaded what difference there is betwixt the Doctor and me, is more in words than in reality.

But, whether I agree with the Doctor or not, I totally disagree with the late author above mentioned, who, as I have observed, puts an end to all science of mind, by distinguishing sensations and ideas no otherwise than by the greater or less liveliness of the impression they make upon the mind. And accordingly, in treating this subject of *liberty* and *necessity*, he makes no difference betwixt *ideas* and *sensations*, betwixt *sense* and *intellect*, *appetite* and *will*, betwixt *material* necessity, by which any body is moved contrary to its natural tendency by *external* force, and that *internal* necessity by which the mind is determined. And, as he proceeds in this manner, it is no wonder that his conclusion is, that there is no such thing as liberty of *will* or *action*, and that we are nothing but a kind of *automates*, or machines, merely passive, and acted upon by external impulse,

— Ut nervis mobile lignum.

One should have thought, that the author might have been satisfied with the glory of maintaining a paradox so contrary to the common sense and feelings of mankind; but he desired to be as impious and blasphemous as he is paradoxical; and, therefore, the conclusion of his argument is, That, as there is a continued chain of necessary causes pre-ordained and pre-determined, influencing the volitions of *men*, in the same manner as the operations of *matter*; and, as this chain of causes reaches from the Original Cause of all, that cause must be mediately the Author of all moral evil, as well as natural; consequently cannot be that Good and Beneficent Being, which we suppose him to be, but a Being of a very different kind, wicked and malignant, being ultimately the author of guilt and moral turpitude in all his creatures, and, by consequence, the cause of all their misery*.

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* This author is less sceptical in a conclusion of such daring impiety, than he usually is in his conclusions. That I may not appear to have misrepresented his meaning, I will give his words, taken from the London edition of his works, published in four volumes, under the title of 'Essays and Treatises on Several Subjects, by David Hume, Esquire.' In the third volume is contained his treatise upon *liberty and necessity*; where, after having laid it down, that the liberty of human actions, and their merit and demerit, is founded upon nothing else but their proceeding from the internal dispositions of the mind, and having also laid it down, that the dispositions and volitions of the human mind are determined in the same manner as the operations of *matter*, *by a continued chain of necessary causes, reaching from the Original Cause of all, to every single volition of every single creature*, (p. 141.) he states this alternative, 'Either that, if human actions can be traced up, by a necessary chain, to the Deity, they can never be criminal, on account of the infinite perfection of that Being, from whom they are derived, and who can intend nothing but what is altogether good and laudable: Or, if they be criminal, we must retract the attribute of perfection which we ascribe to the Deity, and must acknowledge him to be the ultimate author of guilt and moral turpitude, in all his creatures;' p. 142. Then, having rejected the first alternative, and having shown that human actions are criminal, the second alternative, according to his method of reasoning, is unavoidable. And, accordingly, he concludes his argument in these words: 'The second objection, (viz. that the Deity is ultimately the author of guilt and moral turpitude in all his creatures,)

What is here said concerning this famous question of liberty and necessity, I thought necessary for the understanding more fully the nature

'tnres,) admits not of so easy and satisfactory an answer. Nor is it possible to explain distinctly, how the Deity can be the mediate cause of all the actions of men, without being the author of sin and moral turpitude.' Then, desiring to cover this shocking impiety with the veil of mystery, he adds, 'These are mysteries which mere natural and unassisted reason is very unfit to handle; and, whatever system it embraces, it must find itself involved in inextricable difficulties, and even contradictions, at every step which it takes with regard to such subjects. To reconcile the indifference and contingency of human actions with prescience, or to defend absolute decrees, and yet free the Deity from being the author of sin, has been found hitherto to exceed all the skill of philosophy.'

It was to have been wished that this author had kept to the philosophy that he had the honour first to import into this country from the Continent, which teaches,

Naturam rerum haud divina mente coortam, *Lucretius.*

and that there is nothing in the universe besides *matter* and *motion*. Who maintains this doctrine, however impious he may be thought, cannot be said to *blaspheme* a Being whose existence he denies; But he who supposes that there is a God, and, at the same time, maintains, that he is wicked, malignant, and the author of the misery of his creatures, is both impious and blasphemous in the highest degree.

The doctrine of the Manichaeans, that there were two governing principles in the universe, one *good*, the other *evil*, which, of late, has been attempted to be revived by Mr Bayle, was thought the most dangerous heresy that ever was in the Christian church. But, before Mr David Hume, I believe there never was heretic or philosopher, antient or modern, nor, I believe, any mortal man, who maintained that there was but one governing principle in the universe, and that this principle was evil and malignant in the highest degree;—in short, that the God of this universe was a devil. Suppose, what I think can hardly be conceived, that a man was firmly persuaded of a system so absurd, as well as impious, there is nothing but the most extravagant vanity, regardless altogether of the good of society, or quiet of mens minds, that could induce him to publish it.

As to the perplexities and absurdities on both sides, which this author pretends to find in the question concerning liberty and necessity, I consider them only as some kind of apology for the side he has chosen to take in this question; but, if they were real, it is not to be wondered at, that an author, who has not learned to distinguish betwixt sense and intellect, appetite and will, and who, consequently, is ignorant of the

nature of mind, and for explaining that prime operation of intellect in practical life, I mean the *will*. It will be the business of another part of my work, to account for moral as well as natural evil in the universe, without charging either upon the Deity, where I hope very clearly to demonstrate, that there could have been no material world, no general laws by which it was to be governed, and, by consequence, no system in the universe, without both, in a certain degree. And, at the same time, I trust I shall be able to show, that the proper use or abuse which man makes of his liberty and free-will, is the ground of merit or demerit, rewards or punishments.

And here I conclude what I have to say on the subject of *Mind*, the great efficient cause of the universe, the Author of all production, and of all beauty, order, and regularity; not only the First Mover, but that by which all motion, through every part of Nature, is perpetually and constantly carried on;—that, in short, by which the whole frame of things is sustained and preserved.

the first principles of the philosophy of mind, should be puzzled and perplexed in a question, which, no doubt, requires very just thinking, and exact discrimination of things that seemingly very much resemble one another.

BOOK

B O O K III.

Of the CATEGORIES, or UNIVERSAL FORMS.

C H A P. I.

Philosophy among the Antients the Knowledge of all Things in the Universe—All things to be known by their Causes only—The Knowledge of all First Causes belongs to Metaphysics—Three Kinds of Causes already treated of—Formal Causes now to be considered—The Nature and Number of them first discovered in the Pythagorean School—published first by Archytas, in his Work concerning the Universe—then by Aristotle, under the Name of Categories—Great Utility of this Discovery—Reference to Mr Harris's Work for the Explanation of each particular Category.

THE Antients, as I have observed elsewhere, appear to have had more general and extensive notions upon every subject than we have, but particularly concerning that science we call *philosophy*. Among us, a man who knows a great many facts of natural history, who is a geometer, and, especially, if he be likewise an astronomer, and apply geometry and calculation to the motions of the celestial bodies, is accounted a philosopher ; but, among them, philosophy was an

an *universal* science, for it was the science of the *universe*, and of all things therein contained, *divine* and *human*.

It may be asked, How the human capacity can acquire or contain the knowledge of all things ? Of individuals, the knowledge must be admitted to be infinite and incomprehensible by us : And even the *specieses* of things are so many, as not to be numbered, and far less the knowledge of them to be acquired by mortal man—How then is the philosopher to know all things ?

The answer is, that there are only two ways of acquiring this universal knowledge—The first is, by knowing the elements and constituting principles of this universe—The second is, by knowing, in general, the nature of all things existing in it ; that is, by reducing them to general classes, and understanding the nature of each of these classes ; of which, every genus, species, and individual, comprehended under that class, must necessarily participate. Of the first of these kinds of universal knowledge, I have already treated, and have endeavoured to explain the nature of *motion*, *energy*, *action*, *passion*, *matter*, *form*, *mind*, and the other things above mentioned ; which are, undoubtedly, the elements or principles, of which, or by which, this universe may be said to have been made or constituted : And, under this head, are to be found the *material*, *efficient*, and *final causes* of all things. And I am now to proceed, according to the method I proposed, to treat of the second kind of universal knowledge, by which we learn to know the *formal causes* of all things : For, as metaphysics is the science of *principles* or *first causes*, it is necessary that it should treat of all these four causes.

By the knowledge of the three first causes, we know what may be called *cosmogony*, or the generation and production of all things ; and,
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by the knowledge of the last, we know the nature of all things as they actually exist.

As this universal knowledge, which, as I have said, distinguishes philosophy from all particular sciences, is not to be easily understood by those who are entirely ignorant of the antient philosophy, I will, for their sake, give an explanation of it from an author who has written the best introduction to philosophy that ever was written, I mean Ammonius Hermeiras, the scholar of Proclus, and the master of both Philoponus and Simplicius, the two most voluminous commentators upon Aristotle. In his commentary upon Porphyry's Introduction, p. 14. he thus explains how this universal knowledge is to be acquired: 'It is impossible,' says he, 'to know each individual of any species, because these are of number infinite and incomprehensible, at least to us; and, in this respect, it is impossible to know all things: But we may know the nature of the species. Every particular man, for example, we cannot know; but, if we know the definition of man, we know the nature of man, of which every individual of the species participates; and, in this sense, we may be said to know *all men*. The same is true of horses, dogs, and every other animal we know. Further, the specieses of animals, though not infinite in number, are so many, that it is impossible we can know them all, except by reducing them to one common nature; and, in this way, acquiring the idea of *animal*, we may be said to know all the specieses of animals, and, by consequence, all the individuals under those specieses; in short, all animals.—The same is the process of the human mind, with respect to vegetables, till we acquire the idea of *vegetable*, by which we know all vegetables of every kind.—Further, if we would acquire knowledge still more comprehensive, we try to form an idea more general, comprehending both animal and vegetable, by endeavouring to discover what they have in common. In this way, we form the idea of the *τὸ ζῶον*, or of *life*

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‘and *animation*; and thus we know all that is animated, whether animal or vegetable.—By a like process of the mind, from particulars to generals, and from what is general to what is more general, we acquire the idea of what is *inanimate*, comprehending earth, stone, minerals, &c. all which we may be said in this way to know.—Further, to make our knowledge still more comprehensive, we discover, that what is animate and inanimate, has something in common, which we call *body*; and thus we acquire the knowledge of all things corporeal.—In the like manner, from particular minds, or animating principles, we acquire the idea of *mind* in general; and, by observing what mind has in common with body, we enlarge our knowledge still further, and acquire the idea of *substance*, the first of the general classes above mentioned.—In the same manner, proceeding still from particulars to generals, and from what is general to what is more general, we form the ideas of the rest of these classes, such as *quantity, quality, &c.*; and, by doing so, we may be said to know, in general, at least, all the particulars contained under these several classes *.

Thus far Ammonius, who has said enough to explain this general kind of knowledge, but not to be understood except by those who know the elements, at least, of logic; a science in which, I am afraid, many of our modern philosophers are very deficient; and yet, without understanding so much of it as to know what *genus, species, difference, proper*, and *accidental*, are †, it is impossible to have any comprehension of this universal philosophy; nor, even in particular sciences,

* See all this explained at more length by Ammonius, *ubi supra*.

† These are Porphyry's *five words*, as they are called, upon which he has written a treatise that he intended for an introduction to Aristotle's logical works. And it is from Ammonius's commentary upon that introduction that I have taken what I have quoted from Ammonius.

ences, to carry on any investigation properly : For, without this knowledge, we cannot distinguish betwixt that method of investigating by which we begin with the highest genus, to which the thing we want to know the nature of belongs, and continue dividing it into several subordinate specieses, till, at last, we find the thing we are seeking for. This is called the *method of division*, of which Plato has given us some fine examples in his *Sophista* and *Politicus* : And Mr Harris has given us a very beautiful one in his Dialogue upon *Art*. The other method, called the *Method of Analysis*, is the reverse of this ; for, instead of *descending* from what is more general to what is less, we *ascend* from what is less general to what is more ; a method of investigation which undoubtedly has been the method of discovery in all sciences, because it begins where human knowledge begins, that is, with particulars and individuals ; and, therefore, is the only method that can be practised when the thing is entirely unknown. But, to be able to distinguish those two methods, and to practise either of them that is most proper, it is absolutely necessary to have some knowledge at least of that *art*, which Cicero says is the greatest of all arts, ‘ *Quae docet rem universam tribuere in partes, latentem explicare definiendo,*’ &c.*

Those philosophers, I know, who deny the existence of generals, and say that we have nothing but sensations, stronger or weaker, will laugh at these divisions into genus, species, &c. ; but such philosophers are mere materialists, and must, in consequence of these principles, deny the existence of mind altogether, and, particularly, as I have shown, the existence of the Supreme Mind, which it is impossible to conceive without ideas. And, if he be the Author of the universe, there must of necessity be an intellectual world, as well as a material. *Secondly*, If there be only sensations, and no ideas, it is impossible there can be any science, which cannot be without generals, and an order too and subordination of generals, one rising above another, till we come to univer-

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* *Brutus*, five de claris Oratoribus, cap. 41.

faits, or *categories*, as they are called by Aristotle, above which there are none other ; for, as shall be afterwards shown, the whole doctrine of the syllogism depends upon the subordination of generals, and the one comprehending the other. And, *lastly*, if there be no difference betwixt sensations and ideas, it is impossible to assign any characteristical and specific mark of difference betwixt *man* and *brute*, such as distinguishes them in kind, and not in degree only ; in which respect, the animals of the same species are clearly distinguishable one from another. Whereas, if the difference betwixt ideas and sensations be admitted, the distinction is easily made of *kind*, betwixt the two. Now, in order to perceive this difference, I only desire that a man should look about him, and consider the face of Nature, such as it presents itself to him. In the first place, there are a great many different objects, which he perceives by his senses ; and this the brute does as well as he. But, Does not man do something more ? Does not he arrange and distribute these objects into different classes ? Does not he consider such an animal, such a vegetable, as belonging to a certain class of beings ? And does not he make those classes an object of his contemplation, and a subject of his thoughts and reasonings ?—Now, I ask, Whether the brute does so ? and I think the answer must be, That he does not. If so, there must then be a superior faculty in man, by which he makes those arrangements and distributions, and forms those notions or classes. Now this faculty I call *intellect*, and those notions or classes, which are the objects of it, *ideas*. And in this way, I say, *man* is essentially and specifically distinguished from the brute, not in degree only.

In this manner, I think, the distinction betwixt *sense* and *intellect*, *sensations* and *ideas*, and, consequently, *man* and *brute*, must be obvious to every man of common sense, though he has learned no logic, nor any science of any kind. And, though I have said a great deal already upon this difference, yet I hope the reader will forgive me for stating

stating it again in this obvious and familiar manner, as it is the foundation of all philosophy, and particularly of this metaphysical philosophy, which is the science, not of *generals* only, but of *universals*.— But I now return to the proper subject of this chapter, which is concerning the nature of this universal knowledge that we acquire by the study of the categories.

A general science of this kind, it is manifest, will not fit a man for the practice of any particular art, or of the great art of life, without the knowledge of more particular arts and sciences, and without that observation and experience which is absolutely necessary for acquiring the knowledge of individuals; for it is of these, as I have observed, that practice consists. But it is the knowledge of a philosopher; who knows nothing worthy of that name, if he does not know the causes, and the *first* causes, too, of all things. And it is not only the knowledge of the highest kind, but a knowledge that may be very useful, when brought down to the practice of life, and joined with experience.

Further, the second part of this universal knowledge, of which I am now to treat, viz. the doctrine of the highest *genera*, or first *formal* causes of all things, is absolutely necessary for perfect science or demonstration of every kind; so that, without it, no man can be said to be perfectly learned in any one particular art or science. The reason of which is, that there can be no science without definition, nor any perfect definition, without the knowledge of these highest genera.

For understanding of this, we must be so far logicians, as to know the distinction of *genus* and *species*, and that every definition consists of the specific difference and the genus; that is, the general idea, comprehending the thing defined. Thus, in the definition of *man*, the specific difference is *rational*, and *capable of intellect and science*; and the

the *genus* is *animal*. So that *man* is an *animal* rational, and capable of *intellect* and *science*. But, by that definition, it is impossible I can know what *man* is, unless I know what *animal* is; and that, again, I can know no otherwise than by definition; I must therefore likewise define *animal*: Nor can I do that, without discovering the genus of *animal*, as, before, I discovered the genus of *man*. That genus I accordingly find out to be the *το ἑμψυχον*, or *animated substance*. But, how far am I to go on in this way? If I am to go on to infinity, and there be no stop, it is evident there can be no compleat definition, nor, consequently, any science; for there is no science of infinites. There must therefore be, of necessity, some highest genus, beyond which we cannot go. And this highest genus is what I call the first *formal* cause of the thing, being that universal form which comprehends the particular form of the thing defined, as well as of many other things *.

The question, then, is, What these *forms* are, and how many? for, if they could not be reduced to number, there could be no science of them; and the principles of things would, in so far, be infinite and incomprehensible. But, in the Pythagorean school, or, rather, I believe

* See Origin of Language, Vol. I. page 72. and page 520. where this rise of ideas or generals, above one another, till we come to those universals, is explained. I will only add here, that the definition of any thing is, in the language of Aristotle, called the *ειδος*, the *το τι ἔστι*, or, simply, the *το εἶναι*, or, lastly, the *λογος τῆς οὐσίας*, all which denote the same thing, viz. the *idea* or *form* of the thing, which is what is comprehended in the definition. For the *matter*, though we may consider it in conjunction with the *form*, (as Aristotle says we ought to consider all natural substances,) is never part of the definition, being, by its nature, indefinable. There is, therefore, a distinction betwixt the *οὐσία*, or thing actually existing, that is, the matter and form conjoined, and the *λογος τῆς οὐσίας*, that is, the *form* simply, as comprehended in the definition. Thus, there is a difference betwixt *ανθρωπος*, that is, the compound, and *το εἶναι ανθρωπου*, that is, the *form* simply; a manner of speaking, not intelligible, except to those who know the distinction betwixt *matter* and *form*; and that, in the opinion of Aristotle, and, indeed, all the antient philosophers, it is the *form*, which gives *being* to the thing, and makes it what it is.

lieve, in the Colleges of Priests in Egypt, the number of them was fixed, names given to them, and their nature explained. This so great discovery was first published by Archytas, the Pythagorean, in a work which he intitled, *περί του παντος*, or, *Of the Universe*; for it was certainly intended by him as a metaphysical work, in which the universal forms of all things in Nature were to be explained. This work, as I have observed elsewhere, was transferred by Aristotle into his *Logical System*; and very properly set at the head of it, under the name of *Categories*, by way of eminence, that is, *Universal Praedicates*; and it was very properly so placed; for, as it was the professed intention of that work, to explain the Nature of science and demonstration, and, as it has been shown that there can be no perfect science without the knowledge of these universals, it was very proper that Aristotle should begin with them, as the foundation of all science. And he has, not only in his logic, but through the whole of his philosophical works, made frequent use of them, both in proving and refuting.

The doctrine of the Categories has this further advantage, that it shows us, at once, the whole extent of human knowledge; for every thing that is to be known, falls under one or other of the Categories. Now, a general view of this kind may, I think, be of great use in preventing pedantry and conceit: For one learned in the subjects of any one category, for example, a mathematician, who has studied both geometry and arithmetic, and so is learned in the category of quantity, both continuous and discrete, may therefore imagine, as many of them have done, that he is a philosopher, and has that universal knowledge which I have said belongs to philosophy; but, if he has studied the categories, he will know how many other subjects there are of knowledge, and how short he is of the knowledge of the *powers* and *principles* of the universe: For, though it be true, in one respect, what the Pythagoreans said, that all Nature consists in number, under which they included figure, and every thing having measure or proportion of any kind; yet, in order to know the universe, we must know

know the things to which the properties of *number* and *figure* are applicable.

The number of these Categories is ten ; and they are enumerated by Aristotle in the beginning of his book just now mentioned. The particular nature of each of them has been so accurately and elegantly explained by Mr Harris, in his Philosophical Arrangements, that, without repeating what he has said, I shall only make some general observations upon them.

CHAP.

C H A P. II.

Necessary to be proved that Generals exist—That Necessity owing to the total ignorance of antient Philosophy—That there are Ideas existing somewhere, and particularly in the Divine Mind—Whether they exist in the Human Mind, a Question of Fact—The Confusion of Sense and Imagination with Intellect, the Ground of the Error of the Materialists on this Point.—No Science without Ideas—Neither Definition nor Demonstration of Individuals.

BUT, before I proceed to those observations, it will be proper to show that the Categories have an existence; for, if it be true that there is no such thing as intellect, and that there is no difference betwixt sensations and ideas, except in the degree of the impression that they make upon the mind, according to the philosophy of the author of the *Essays*, then there is no such thing existing as generals, nor, by consequence, categories, or predicaments, which are no other than the most general ideas. Whereas, on the other hand, if it be proved that we have the conception of generals, it is, I hope, made sufficiently evident, in the preceeding chapter, that there is a progress in the mind from less general to more general, till we come to what is most general of all, or universal, that is, the categories.

That there should be any dispute upon this subject, must appear very wonderful to those who have studied the philosophy of Plato and

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Aristotle ; and, indeed, it is to me a proof, that even the memory of antient philosophy is in hazard of being lost among us. As to Plato, the chief end and general scope of his philosophy is, to raise the mind from material and particular things, which he considers as having no existence, properly speaking, but as in a constant flux and vicissitude of generation and corruption, to generals or *ideas*, (a word, which, as I have elsewhere observed *, he borrowed from the Pythagorean School,) considering these alone as truly existing, and the only proper objects of science †. And, as to Aristotle, the distinction betwixt sense and intellect, particulars and generals, the former being the objects of sense, and the latter of intellect, runs through his whole philosophy ; and, particularly, is the foundation of his system of logic, and of the syllogism, which he tells us, again and again, cannot be without general propositions. And it is plain, from almost every page of his works, that he had no notion that there could be demonstration or science of any kind, without generals. And it is evident, from his setting the book of Categories at the head of his philosophical works, that he thought the knowledge of the most general ideas a necessary introduction to philosophy.

That a man who believed nothing, and affected even to doubt of his own existence, and who, besides, had no regard to religion, either natural or revealed, should argue against the existence of ideas, and, by allowing us only sensations, more or less lively, depress us to the rank of brutes, is not so much to be wondered at : But, that a Christian,

* Origin and Progress of Language, Vol. I. p. 116. edit. 2.

† It was for this reason that he considered not the corporeal man, or horse, as the *real* man or horse, because they were constantly changing, and, at last, perished, or, at least, were dissolved ; but the idea of the man, or the horse, he said, was the *thing* ; which, therefore, he called the *αὐτὸ-ἄνθρωπος* or the *αὐτὸ-ἵππος*, that is, the *man itself*, or the *horse itself* ; an expression which I know has been much ridiculed by materialists, both antient and modern, but which, I think, a proper expression, importing that distinction betwixt corporeal and intellectual things, which is the foundation of all true philosophy.

tian, and a Bishop, such as Dr Berkley, the intention of whose writing was to confute the Atheists, and to establish the belief of immaterial substances upon the most solid grounds, should maintain the same doctrine, can be ascribed to nothing else but to absolute ignorance of the philosophy of both Plato and Aristotle ; for, tho' Aristotle would not admit that those ideas had a separate existence, not only out of any corporeal substance, but out of the mind of any intelligent being, which he says his master Plato maintained ; yet, neither he, nor any of the philosophers of his school, had the least doubt but that they existed in the mind.

With men who, out of mere vanity, maintain the most extravagant paradoxes, without regard of what the consequences may be to religion and morality, provided, they acquire the reputation of great abilities and superior parts, it would be vain to argue ; but, to those who believe in God, and think there is such a thing as *science* and *demonstration*, I would suggest the following considerations :

And, in the *first* place, if they believe that there is a God, and that he is the author of the universe, they must admit the distinction betwixt the intellectual and the material or visible world, and, consequently, that there are ideas, at least in the Divine Mind ; for, however they may confound sensations and ideas in the human mind, where both undoubtedly exist, it is impossible they can believe that the Deity can have any perception by organs of sense ; so that nothing can be in his mind but ideas, which every Theist must believe to be the pattern and exemplar of the visible world. It must therefore be evident, to all those who are not Atheists, that there are ideas existing, at least, in one mind ; and from thence he may conclude, that it is not impossible that the human mind may so far participate of the Divine Nature, as to be able to form ideas, infinitely less perfect, no doubt, than those of the Divine Mind ; and with this remarkable difference, that our ideas, in

this present state of our existence, and united as we are with matter, cannot be formed without the assistance of our senses, and of sensible objects: Whereas, it would be impious and absurd, in the highest degree, to suppose that the Deity had any such dependence upon matter.

It being thus certain, that there are ideas somewhere, the only question remaining is a question of fact, Whether or not the human mind has the capacity of forming ideas? or, in other words, Whether it has the capacity of considering one or more qualities of a thing, separate from the rest? Whether, for example, it can consider the quality of being bounded by three lines in a triangle, abstracted from being white or black, of wood, stone, or metal? Or, Whether it can perceive it only as it is presented by the senses, that is, with all the qualities which are peculiar to it, and distinguish it from every other individual triangle? This question I have treated of at great length in the *Origin and Progress of Language* *; where, I think, I have put it beyond all doubt, from fact and observation, as well as reason, that the human mind has such a power. And, indeed, if there were nothing else to prove it, the science of arithmetic is alone sufficient; for, though number be one of the most abstract ideas we have, by which we divest things of every quality and circumstance, even of those common attributes of time and space, and leave them nothing but the simple quality of existing each by itself, yet, even our children are able to form this most abstract idea, and add, subtract, and multiply, without the least thought of applying numbers to particular things; a proof of which is, that they consider each unit as perfectly equal to another, without the least difference among them, which they could not do, if they applied them to men, oxen, sheep, &c.; and they also consider them as indivisible, till they come to be taught

* Vol. I. b. 1. c. 9. p. 110. edit. 2.

taught that kind of arithmetic we call fractions, but which was unknown to the antients, and is truly the arithmetic of ratios.

It will be said, that the idea of *number*, thus abstracted from all sensible things, or, even a general triangle, cannot be apprehended by the sense, or pictured in the imagination. And this, no doubt, is true; and if, like the brutes, we had no other faculties except sense and imagination, like them, too, we should have no ideas: But we have another faculty, and that a much superior one, I mean *intellect*: And the fundamental error of those philosophers, and which leads, as I have shown elsewhere *, to the most dangerous consequences, is their confounding intellect with sense or imagination. The consequence of which is, no doubt, what the author of the *Essays* maintains, that ideas and sensations differ only in the degree of impression they make upon the mind, not in kind.

That, without ideas, there can be no science, will be evident from the following consideration, that all material things are perpetually in motion of one kind or another, and therefore constantly changing. This was known to the philosophers of Greece, as early as the days of Heraclitus, who said that every thing was in a perpetual flux, and continually passing, like a river: So that, by our senses, we never can apprehend the same thing twice, any more than we can bathe twice in the same river †. And this philosophy of his was adopted, as Aristotle tells us ‡, by Plato, who every where speaks of material things

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* Page 142—200.

† Cratylus, a follower of Heraclitus, found fault with his master, because he said that one could not bathe twice in the same river; for, says he, he cannot bathe once in the same river. And he carried the matter so far, at last, as to affirm nothing, but only to point with his finger, things being constantly in motion, and nothing standing still, so long as that any thing can be affirmed of them. *Aristot. lib. 4. Metaph. cap. 5. p. 378. edit. Du Val.* And, no doubt, this is the necessary consequence of the doctrine of Heraclitus, and every system of materialism.

‡ *Metaph. lib. 1. cap. 6.* See what I have further said upon this subject, *Orig. and Prog. of Lang. vol. I. book 1. cap. 9. p. 114. 2d edition.*

as having no permanent existence, nor *existence* properly so called, but something which he expresses by a word that, like many other terms of the Greek philosophy, cannot be rendered into English, without much circumlocution *. Such things, therefore, being perpetually changing, cannot be objects of science, or of eternal truth, of which the objects must, like itself, be eternal. Whereas, should we attempt to demonstrate any property of a material thing, it would not continue the same thing till the demonstration was ended. Therefore, says Aristotle, there is no definition, demonstration, or science, of particular or individual things. And, I will venture to say, that no man, who is a man of science of any kind, or who knows what science or demonstration is, will maintain the contrary; for, what is the object, according to those material philosophers, of the geometrical science of a triangle, for example? it is an indetermined number of particular triangles, perceived by the sense, with a number of indetermined qualities, such as being black or white, equilateral, isosceles, scalenum, right-angled, obtuse-angled, &c. Now, will any man, who is a geometer, say,

* The word is γιγίσις; and every material being, he says, is εν γίγισι, or, as he otherwise expresses it, ουκ ἔστι, ἀλλὰ γίγισται; the meaning of which is, that such things are never in any fixed or permanent state, but are perpetually changing from one state to another, and becoming what they were not before. To such things he opposes the τα ὄντα, a word which occurs in almost every page of Plato, by which he means nothing else than the *ideas* of things which are permanent and immutable, while the *things* themselves are constantly changing; and therefore he says they are, γιγισμια ὄντα δι' οὐδὲ ποτε; whereas ideas are the τα ὄντα, and the τα αἰεὶ καὶ ἄσφαυτος, καὶ κατὰ ταῦτα ἔχοντα. And, in the *Timaeus*, he divides all things into these two classes. His words are, Ἔστιν οὖν δι' κατ' ἐμὴν δόξαν πρῶτον διαίρεσις τα δὲ τι το οὐ μὲν αἰεὶ, γίγισιν δι' οὐκ ἔχον. καὶ τι το γιγισμιοι μὲν, οὐ δι' οὐδὲ ποτε. το μὲν δὲ τῆς μετὰ λόγον περιληπτοῦ, αἰεὶ κατὰ ταῦτα οἰ. το δ' αὖ δόξα μετ' ἀισθητικῆς ἀλογου, δόξαστον, γιγισμιοι καὶ ἀπολλομιοι, οὕτως δι' οὐδὲ ποτε οἰ. *Timaeus*, pag. 1046. edit. Ficini. It is with this distinction that Plato begins his Cosmogony, and System of the Universe; and, indeed, it is a distinction which appears to me to be the foundation of the whole philosophy of Nature, though it be not made in any modern book of natural philosophy that I remember to have seen. For in no other way can we conceive any thing in the universe to be fixed, stable, and permanent; but, in this way conceived, the universe, and every thing in it, is eternal and unchangeable as its great Author.

say, that such a confused complicated notion (and such all the perceptions of sense are) is a proper subject of a science of such certainty as geometry?

But, further, upon the supposition that we have only perceptions of sense, weaker or stronger, there not only can be no science, but no truth or falsehood; because there can be no criterion of either; or, if there be any, every man must be the standard of truth to himself, according to the doctrine of the antient sophist Protagoras; and every thing will be true which appears to be so to every man. Now, as things appear very differently to different men, and to the same men at different times, the consequence necessarily is, that the same thing will be both true and false; or, in other words, that there is no such thing as either truth or falsehood. The foundation of this opinion, as Aristotle informs us *, is no other than the doctrine maintained by those among us who deny the existence of ideas, viz. that we have no knowledge except sensation, nor, consequently, any other criterion of truth or falsehood besides our senses. Now, as sensation depends not only upon the operations of external objects upon our organs of sense, but upon the disposition of these organs, it will often happen that, though the operation of external objects be the same, yet the sensation will be very different, by means of the different disposition of the organs, not only in different men, but in the same man at different times. And, besides the disposition of the organs, there are, in those senses which perceive things at a distance, such as sight and hearing, different dispositions of the *media* through which such senses operate; and these, as is well known, make a great difference in their perceptions. So that, according to this philosophy, truth or science is a mere spectre or phantom, appearing differently to different men, or to the same man at different times, without any substance or reality. But, the true answer to Heraclitus, Protagoras, or whoever else, *antient or modern,*

* *Metaph.* lib. 4. cap. 5.

modern, philosophises in this way, is what Aristotle makes, that there is something else in the universe besides matter and motion ; for there is that which is immoveable, without generation or corruption, meaning ideas *.

I think I may therefore conclude, that those who deny the existence of ideas, are not only perfectly ignorant of the antient philosophy, but of the nature of science, and of truth in general.

Having thus cleared my way to the Categories, I will proceed to make some observations upon them in the next chapter.

C H A P.

* His words are, *Ετι δ' αξιωτάριμν αυτους υπολαμβάνειν και άλλην ουσίαν είναι τών ουτων, ή ουτι κινήσις ή παρχει, ουτι φθορα, ουτι γένεσις το παρκαπν.* Metaph. lib. 4. cap. 5. This sentence alone, I think, would be sufficient to acquit Aristotle of any imputation of materialism ; for, as ideas are undoubtedly immaterial things, it is impossible to conceive how the soul, if material, could produce them ; for what is immaterial never can come from what is material.

C H A P. III.

General Observations upon the Categories—Other Divisions of the whole of Things, such as that made by Porphyry, and also that made by Plato—The Nature of the Division made by Archytas—his Work Metaphysical—Aristotle's Book of Categories a Logical Work—The Nature of Porphyry's Division—The Nature also of Plato's—Both different from that of Archytas—Examination of the Universals of Archytas—Whether there be too many or too few of them—not too many of them—nor too few—Shown that Motion ought not to be one of Archytas's Universals—nor Time—nor Space—nor Matter—nor Form—nor Power—nor Faculty—Mind, considered as a Substance, falls under this division—Habit likewise falls under it—Aristotle's Division into Categories, not compleat—Conclusion of this Part of the Work.

THERE have been other divisions made of the universality of things, such as that division treated of by Porphyry, in his introduction to Aristotle's book of Categories, where he has divided all things into *genus, species, difference, property, and accident*. Such also is the division made by Plato, consisting likewise of five members, viz. *being* (for so I translate the *ousia* of Plato,) *sameness, difference, motion, and rest*. If these divisions are in the same respect, and are full and compleat, it is manifest that the division of Archytas, and of Aristotle, must be improper, as consisting of too many members: And, supposing them to be in different respects, and for different purposes, it is to be inquired in what respects they differ; and,

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when that is determined, it will still remain to be inquired, whether the division of the categories be full and compleat, such as has nothing wanting, or nothing redundant? These, I think, are questions of some curiosity, and of great importance, for understanding rightly the doctrine of the Categories.

And the first thing to be considered is, in what view, and for what purpose, Archytas made this division of things. And I think it is evident, both from the title of the work, and from what Simplicius has preserved to us of it, which, I believe, is by far the greatest part of it, if not all, that it was a metaphysical work, in which it was the intention of the author to treat of the general principles of all things in the universe that actually existed, and which constituted the whole of things: In short, it was what I am treating of now, under the second head of my division of metaphysical subjects, viz. the *universal forms* of all things.

It is not, therefore, of the *efficient causes*, or of the constituting principles of the universe, that Archytas treats, but of the *formal causes*, and of *things* as already constituted. And I think it is further evident, that the substances of which he treats are natural substances, not *substances immaterial*, and separated from matter; for, in a passage quoted from him by Simplicius, he divides substances in the same manner that Timaeus the Locrian does, into *matter*, *form*, and the compound of these two, which is the natural body; and, as the *substances* of which he treats are of that kind, so must also the *accidents* be: So that the whole universals of Archytas, being either material substances or their accidents, it is evident that his work must be considered as a treatise of *physics*, or rather *metaphysics*, as it treats not of the particular affections of natural bodies, but of their general principles, and common properties.

On the other hand, it is evident that Aristotle's book of Categories is a logical work: For, the intention of his logic being to explain what

what fyllogifm was, and particularly demonstrative fyllogifm ; and, as all fyllogifms confift of propofitions, and propofitions, again, of terms, the method of fcience required that he fhould begin with terms, as the elements of the whole compofition. And, in order to make fcience of his work, it was neceffary that the number of thefe terms, I mean of the general claffes to which they were all reducible, fhould be afcertained, as well as the nature of them explained ; for, of what is infinite, there is no fcience ; and, without this, the doctrine of the categories would have been as imperfect as the grammatical art would have been, if the number of letters, or elemental founds of which words are compofed, had not been afcertained. Now, this being the nature of Aristotle's work, it is no doubt poffible that the divifion of thefe terms into ten claffes may not be full and compleat, though Archytas's divifion of natural fubftances and accidents may be.

As to Porphyry's *five words*, as they are called, it is evident that they can be none of the univerfals treated of by Archytas ; for they have no exiftence in nature, but only in our minds, being nothing elfe but terms denoting certain operations of our minds upon the *τα οντα*, or the things exifting in this univerfe, by which we confider and inveftigate them in a certain way, difcovering, that they have fome things in common, fome things proper or peculiar, fome things differencing or diftinguifhing, and fome things accidental. But Archytas, in his book, confiders what all thefe things are in themfelves, not the progrefs of our underftanding in the inveftigation of them.

For the fame reafon that neither *genus* nor *species*, nor any other of the five things mentioned by Porphyry, could be numbered among the univerfals of Archytas, it is evident that even *truth* itfelf cannot be one of them ; for truth is nothing but the perception of the connection of two terms of a propofition. Now, a propofition is a combination of two ideas made by the mind ; fo that it is plainly an operation of the mind, and neither *fubftance* nor *accident* exifting in nature.

Of the same nature with Porphyry's *five words*, are the universals of Plato above mentioned ; for they are only so many different ways of considering the things of the universe : For we consider them, either as having a determinate nature in themselves, which constitutes their essence, and makes them what they are ; which I take to be the meaning of the *το ον*, or the *εσση* of Plato, being different from the *ουσια* or substance of Archytas and Aristotle, and applicable to qualities as well as to substances properly so called * ; or we consider them as the same, or as different ; or as at rest, or as in motion.—In short, it appears to me that Plato intended to divide, in this way, all the propositions that we form concerning the things of this universe, not the things themselves. And, I believe, it will be found, upon examination, that all the propositions we form concerning things relate either to their essence, their sameness, their difference, their motion, or their rest.

Thus, it appears that the universals, both of Porphyry and of Plato, are logical divisions, not of things, such as the universals of Archytas ; but it still remains to be inquired, Whether Archytas's division be a complete one ? It is certainly so far complete, as it is a division of things into *substance* and *accident* ; for, the first category is *substance*, and all the other nine are *accidents*. But, as a general division into substance and accident would not have made us much wiser, it still remains to be considered, Whether he has made a proper division of the accidents into nine classes ? and, Whether there be not too many of them, or too few ?

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* See these words, *ουσια*, *ταυτοτης* *ετεροτης*, very well explained by Ammonius, in his commentary upon Porphyry's introduction, p. 79. *ουσια*, says he, is not here opposed to *accident*, (as in the Categories,) but denotes the nature and essence of things, or that by which they are said to be what they are. *ταυτοτης*, or *sameness*, must be in all things, because they have all the same original ; and *ετεροτης*, or *difference*, must be in all things, because they are *many*, and not *one*.

That there are not too many of them, every body must be convinced, who considers what they are; for he will find them distinct one from another, and that not one includes another. Nor do I think that any philosopher has thought that the number of them was too great. But it appears, from Simplicius's commentary upon the categories of Aristotle, that many of the commentators before him thought them too few, and therefore were inclined to add to the number, and, particularly, to make *motion* one of them.

I will therefore begin with motion, and endeavour to account why it is not one of the universals of Archytas: And I hope this will not be difficult to do, after what I have said of it; for, in the *first* place, it is evidently not one of the *formal* causes of natural things, of which, as I have observed, Archytas treats in this work, but one of the efficient causes, and, indeed, the immediate efficient cause of all generation and production; it cannot, therefore, be said to be any thing existing that is generated and produced, but the cause of such existence. *2dly*, It is not only not any thing, but it cannot be said to be the *state* of any thing; for it is, as we have seen, a passage from one state to another. As, however, it cannot be denied that it affects natural things very much, and produces great changes and alterations upon them, the effects of motion, if not motion itself, must be considered as falling under the *categories* of *doing* and *suffering*, the moving power being considered as *doing* and *acting*; and the thing *moved*, as *suffering*.

Akin to *motion* is *time*; which, as shall be shown afterwards, is nothing else but number applied to motion, by which the duration of the existence of any thing is measured. This, considered absolutely and abstractedly in itself, is certainly no natural thing existing, and, therefore, does not belong to Archytas's subject; but, as it accompanies the existence of material things*, I propose to treat of it, under
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* This is the reason given by Simplicius, why neither *time* nor *place* are reckoned among the categories; because, says he, they are something *without* nature, that is,
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the third head of my division. But, though the abstract notion of time does not belong to Archytas's *universals*, yet, in so far as it relates to particular things, it is to be considered as falling under the category of *when*; for, all things that are generated and produced, that is, all things in this lower world, are properly said to exist in *time*; for to them we apply the distinction of *past*, *present*, and *future*.

Space, as I shall show afterwards, is either a mere *non-entity*, or to be conceived only in relation to *body*; and, in so far as it has relation to any particular *body*, so as to be the place of that *body*, it is denoted by the category, *where*.

As to *matter* and *form*, they are clearly the elements of natural things, not the things themselves; and, therefore, have been treated of by me under my first head. Besides, as they have no existence separate from body, and its accidents, they could not have properly fallen under Archytas's subject, which, as I have said, is confined to the material and the visible world.

As to *powers* and *faculties*, of which I have said so much, they are not *things existing*, but only the *causes of things existing*; and therefore have been treated under my first head; and, as to *mind*, the greatest power in nature, so far as it is a substance, it falls under the first category; but, so far as it is only a *cause efficient*, it does not belong to Archytas's subject.

With respect to *habit*, it falls under the category, *quality*; habit being composed of qualities, one or more; and the action or passion thence

re-
not in nature, and only *accompanying* it. And he says, that *matter*, *form*, and *motion*, are none of the categories, because they are what constitute or fill up nature. His words are, και γαρ ἐν τῇ φύσει τῶν ἔχοντι παρακολουθούτων ὁ χρόνος καὶ ὁ τόπος δοκεῖ εἶναι ὡς περ τῶν συμπληρουμένων, ὅλη καὶ εἶδος καὶ κίνησις.

resulting, has each its proper place in the philosophical arrangements of Archytas.

Thus, I think, I have shown, that there is nothing wanting in the universals of Archytas; and, as it is admitted that they are not too many, it follows, that the system is compleat, without either redundancy or defect.

But, as to Aristotle's logical work of the categories, as it was intended for a system of universal *praedicables*, I doubt it cannot be said to be compleat, without those universals that I have mentioned, such as *motion, matter, form, power, faculty, &c.* which are certainly *praedicables*, and are, accordingly, often *praedicated*. And Aristotle himself seems to have been conscious of this defect in the system, as he has added, to the doctrine of the categories, a good deal concerning *motion, habit, privation, and opposites*.

Thus, I have explained both the universals of Archytas, and the categories of Aristotle; and have endeavoured to show that, whatever defects there may be in Aristotle's categories, the system of Archytas is compleat. And I think I have assigned the reason of the difference betwixt them, namely, that Archytas's work was truly a metaphysical work, but which Aristotle by transforming into a logical work, has made neither the one nor the other compleat. In the next chapter I will conclude this book, by comparing this universal science of categories, with other sciences, and particularly mathematics.

C H A P. IV.

The Subject of Metaphysics, Universals or Generals, of the highest Kind—What Generals are not to be understood without some Knowledge of Logic—Difference betwixt Mathematics and Metaphysics—Mathematical Ideas—Number—This the Subject of Arithmetic—Figure the Subject of Geometry—Analysis of it into Superficies, Lines, and Points—Motion—This the Subject both of Geometry and Arithmetic—The Subjects of Metaphysics—Considers what is different, and what is common, in the Subjects of Mathematics—Its Way of considering Motion.—Treats of Subjects not comprehended in any particular Science—The proper Subject of Metaphysics is immaterial Substances—The Way of coming to the Idea of them—Difference betwixt Antient and Modern Philosophy—No sufficient Cause of Motion assigned by the Moderns—Nature, according to their System, defective.

THOSE who believe, like the antient philosophers mentioned by Plato, that nothing exists but what they can grasp or lay hold of with their hands, will no doubt think this whole doctrine of categories to be merely phantastical, without any foundation in truth or reality—*umbrarum hic locus est*, according to them; and they will say, that such airy unsubstantial notions are altogether unworthy of a science, which pretends to treat only of things really existing. The philosophers I mean are those who deny the existence of *generals*, even in the mind, and assert that there is nothing there but the perception of singular and individual things; and the plain scope of which philosophy, as I have shown elsewhere, is, to exclude intel-

intelligence from the universe, to make us believe that there is nothing existing but the material world, and this framed without that archetype, which we call the intellectual world; that is, in other words, without counsel or design.

There are others who, though they admit *generals*, will not so readily allow that there is any reality in *universals*, such as the categories. We admit, say they, that there is the species, *man*, distinct from the individuals of that species; but we do not know what to make of the genus, as you call it, *animal*. It is the misfortune, as I observed before, of many philosophers now a-days, that they have not learned logic; for, if they had, they would know, that what is genus with respect to one species, is species with respect to another genus. Thus, for example, *animal* is the genus with respect to *man*, but it is the species with respect to *animated substance*. It is therefore impossible to make any difference in this matter, betwixt genus and species. Nor, indeed, can it be conceived how we should generalize so far as to form the idea of *a man*, and why we should not generalize so much farther, as to form the idea of *an animal*; for, if we can make such a collection of qualities as belong to man, and to man only, distinguishing him from every other animal, Why should not we make likewise such another collection, agreeing to all animals, and to animals only, and distinguishing them from every other animated substance?

That men, who have no science, should not readily conceive the nature of *generals*, nor be able to distinguish betwixt Peter, James, or John, and the idea of the species, I do not so much wonder; but, I confess, I have often wondered to hear mathematicians deny the existence of *generals*; because this appeared to me to be giving up their science; for, if they say that they demonstrate nothing but of the particular *triangle* upon the paper, they must confess that the *truths* of their science are not *universal truths*, nor *demonstrative truths*; as

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nothing can be demonstrated of any particular material thing, all such things being, as I have shown *, in constant flux, without any stability or permanency ; and therefore incapable of being the objects of science.

Having mentioned *mathematics*, I will conclude this book, with comparing mathematical ideas with metaphysical ; by which we shall be able to discover more clearly the nature of both sciences, and what rank each of them ought to hold among the subjects of human knowledge.

Of both, the archetype is *Nature*, the original of all our ideas ; for, of this book, all arts and sciences are only a transcript. But the difference is, that the mathematician takes his ideas from what is most obvious in nature, and stands, as it were, in the title-page of this book ; whereas metaphysics go very much deeper into it, inquiring into the causes of things, considering those general principles from which every thing less general proceeds ; and, by these steps, ascending even to that universal principle from which all things in the universe are produced : While the science of mathematics takes its subjects from the productions, not the principles of nature, being conversant with the properties of the material and visible world, and those properties of it which, by their nature, are most simple and determinate, being perfectly separate and distinct one from another ; and not mixing with, or running into one another, like other things in nature ; therefore easy to be comprehended in an exact and precise definition.

The first of this kind is *number*, defined by Euclid to be a multitude of *monads*. Now, a monad is the simplest, that is, the least complex of all ideas ; for it considers the thing, without any quality or accident, even of *time* or *place*, and only as existing, and as separate and distinct

distinct from every other thing. It has, therefore, no adjunct or concomitant of any kind, not even place or position; in which respect, as Aristotle has observed, it is a simpler idea than even a mathematical point, which, though it have no parts, and be therefore indivisible as well as the monad, cannot be conceived without position.

Many of these *monads*, or *ones*, considered together by the mind, yet so as each is distinct from the other, is what I call *multitude*. But, in order to make *number*, I think we must add to Euclid's definition, and say that it is *multitude defined or limited*; for, without some limitation, we do not, even in common speech, call it *number*: And brute animals have the perception of *multitude*, and can distinguish betwixt it and *one*; but have not any perception of *number*. And there are barbarous nations who have only the idea of *number* carried so far: (Monsieur la Condamine says, that he met with one upon the banks of the river Amazons, that could count no farther than *three*;) And farther, they have nothing but the confused perception of *multitude*, which they signify by pointing to the hairs of their head.

Plato has observed, that we have the idea of *number* from all the senses. The reason of which, he says, is, that man was made for contemplation and science: And, as the knowledge of *number* is the foundation of all science; therefore nature has made the perception of it more general than any thing else, making it to arise from whatever we see, hear, touch, taste, or smell. But we are not from thence to imagine, that *number* is a perception of sense, or, as Mr Locke would call it, an *idea of sensation*; for each sense only perceives its own objects; and each act of its perception is single and individual, standing by itself, without any consideration of any other act of perception of the same, or any other sense. It is, therefore, intellect only that joins and puts together, as well as separates, and recognizes both the *one* and the *many*.

These are the subjects of *arithmetic*. As to *geometry*, the subject of it is *figure*, which is either *plane* or *solid*. Of the solid, the *plane* or *superficies* is the boundary; and what is contained within the superficies bounding the solid, is what we call *body*. The *superficies*, again, is bounded by *lines*, and the *lines* by a *point*.

Thus, it is evident, that *geometry* does not go deep into the nature of things; for the subject of it is neither *body* nor *mind*; of which two the universality of things consists; but it is only the surface of things with which it is conversant: But, as the ideas of *figures*, *superficieses*, and *lines*, are simple and determinate, and therefore capable of most precise definition, the science from thence arising is accurate and demonstrative, though it do not, as Plato has observed, and as we shall afterwards show, demonstrate its principles, but assumes them.

There is a third subject of mathematical science besides *number*, and the dimensions of *body*; and that is *motion*: For the mathematician considers *body* in motion, as well as at rest; explains the different kinds of its motions; shows how they are compounded; and applies arithmetic to calculate the force of the *moving power*, and the quantity of *motion* produced by it. From *motion*, thus considered, arise three branches of mathematical science, viz. *astronomy*, *mechanics*, and *music*; which, in so far as they derive their principles from geometry and arithmetic, are demonstrative sciences.

These are the subjects of mathematical knowledge; and we are now to show how much farther metaphysics go into the nature of things—The subject of metaphysics is the *whole* of things. This, as I have observed, cannot be otherways known than in its principles or causes. Now, these must necessarily be what is *most general* in nature; for it is from *generals* that *particulars* are derived, which cannot exist without the *generals*; whereas the *generals* may exist without the *particulars*.

lars. Thus, the species, *man*, cannot exist without the genus, *animal*; but *animal* may be without *man*: And this holds universally of all genuses and specieses. The subject, therefore, of metaphysics, is what is principal in nature, and first, if not in priority of time, in dignity and excellence, and in order likewise, as being the causes of every thing in the universe. Leaving, therefore, particular subjects, and their several properties, to particular sciences, this universal science compares these subjects together; considers wherein they differ, and wherein they agree: And that which they have in common, but belongs not, in particular, to any one science, is the proper subject of metaphysics.

In this manner, it considers the subjects of mathematics above mentioned, viz. *number*, *the dimensions of body*, and *motion*. The two first are the subjects, as I have said, the one of *arithmetic*, the other of *geometry*; and it finds this difference betwixt the two, that the subject of geometry is continuous; that is, the parts of it are contiguous, touching one another, and having one common boundary; whereas the parts of the subject of arithmetic are, by their nature, disjoined and separated from one another, each standing by itself. Another difference which it discovers, is, that the parts of the one have place or position, whereas the parts of the other have none*; and a third is, that the one is divisible into an infinite number of parts, whereas the division of the other can be carried no farther than the monad, which, by its nature, is one indivisible thing. According to these differences, therefore, metaphysics distinguishes the subjects of these two particular sciences, calling the one *magnitude* †, and the other *number*.

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* See those two differences fully explained by Aristotle, in the 6th chapter of his book of Categories.

† Euclid uses this word (*μεγεθος*, or *magnitude*), very frequently, but nowhere defines it, referring it, as well as other things, to common sense and observation; and this I think wise in him; for the definition of it must necessarily have carried him beyond the bounds of his science, and into metaphysics.

But things are so connected in this universe, and the *one* and the *many* so mixed together in every part of it, that things are not only different, each from the other, but they also hold to one another by some common band or tie, so that the *one* is to be found in them as well as the *many*; and they are both the *same* and *different*.—This is the case of *number* and *magnitude*, as well as of other things; for they are not only different in the respects above mentioned, but they are the same in this respect, that they have both parts which may be measured or numbered: And it is for this reason that, as Aristotle has observed *, the terms *equal* or *unequal*, can only properly be applied to them. Whereas, of other things, we say, that they are *like* or *unlike*. They must therefore belong to the same genus; and that genus is what is called by the metaphysicians *quantity*, and is divided by them into continuous and discrete, that is, *magnitude* and *number* †.

As to motion, the mathematician takes it up according to common apprehension, and applies to it the principles of geometry and arithmetic, without troubling himself to inquire concerning its nature, and what rank it holds in the order of beings; whereas, the metaphysician inquires into its nature and essence; shows that it has nothing fixed or determinate in its nature, but is a progress from one state to another: That, therefore, it is that which produces all things that are in generation; but that, therefore, it is not of the number of things actually produced and constituted, and, by consequence, none of the categories—that it is in the thing *moved*, not in that which *moves*; and, consequently, that the thing which moves may itself not be moved—and, *lastly*, that what *moves* must, of necessity, be different from what *is moved*; and, therefore, that nothing can *move itself*.

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* Aristot. Categ. cap. 6. *in fine*.

† Euclid, in his definitions, has not mentioned quantity, though it be the genus of the two subjects of which he treats, magnitude and number, because it is an universal, and a metaphysical idea; and the reason probably why he has not defined magnitude, though he has so often mentioned it, is, that he could not have done it without taking notice of quantity.

The most obvious properties of things are those I have mentioned, viz. *number*, *figure*, and *motion*, which are the subjects of the particular sciences I have named. But there are many other properties of things, which, not being of a nature so simple or determinate, and therefore not easily abstracted, have not hitherto been made the subject of any particular science, such as *bitter* and *sweet*, *cold* and *hot*, *moist* and *dry*. These, and such like, are all thrown in together, under one category, to which the name of *quality* is given. In like manner, all actions and energies, however different they may be, are classed under the category of *action*. And sufferings, likewise, however different in kind, are all comprehended under the category of *suffering*. And so on, with respect to the rest of the nine categories of accidents, all which are inherent in the first chief category, viz. *substance*, which does not belong to any particular science, but only to this universal science; the nature of which is, that it comprehends not only what is the subject of particular sciences, but also those things which hitherto have not been reduced to science.

The metaphysical ideas I have hitherto mentioned are all abstracted from matter; more abstracted, indeed, than the mathematical, and more general; and, consequently, nearer the principles and the original of the universe. But the ideas I am now to mention, are of substances altogether immaterial, which, as I have said, are the proper subject of metaphysics. The only passage which can lead the philosopher into this invisible world is *motion*; for, having learned to distinguish betwixt what *moves*, and *is moved*, he soon discovers that the moving power of this universe cannot be material.

It was by this road that the great philosophers of antiquity ascended to the First Cause and Author of all motion, himself unmoved and unchangeable,

—stabilisque manens, dat cuncta moveri.

But

But it is a road not much frequented by our modern philosophers, who appear to me to be disposed to account for the operations of nature from any other cause rather than mind, and to employ a God only as the tragic poets of old did, when they could in no other way extricate their fable.

There is another road to Deity ; but neither is it much beaten by the philosophers of this age. It is that which lies through formal causes. In the works of art, every body distinguishes betwixt the *matter* and the *form* ; but, in the works of nature, we seem to think that all is material ; whereas, all the antient philosophers, such of them, at least, as were not Atheists, made the distinction betwixt matter and form the foundation of their natural philosophy : And with the *formal* cause is necessarily connected the *final* cause ; for, if there be a form of any thing, by which it answers a certain purpose, there must necessarily be a *final cause*, or end proposed. And, again, if there be an end proposed, there must be a form suitable to that end, unless we can believe what Epicurus professed to do, (for I cannot think he really believed so), that the eye, being formed, such as it is, by mere matter and mechanism, the use of it, for seeing, was afterwards, upon trial, found out. Some, indeed, of our more religious philosophers, speak a good deal of final causes ; but the greater part of them seem to consider nothing in the works of nature except matter and mechanism.

But this material and mechanical philosophy is essentially defective in this respect, that it assigns no efficient cause of the operations of nature, unless they could show, that matter and mechanism could operate without any moving power, or had that moving power in themselves. It is true, indeed, that the British philosophers, with the exception of very few, allow the necessity of an immaterial first mover ; but they say, that the machine, being once put in motion, goes on of itself, like a piece of clock-work,

work, by mere mechanical causes. But this wonderful machine they have never been able to explain, except by making suppositions of mechanical powers of attraction, repulsion, and the like, which, if not inherent in matter, and essential to it, are, they say, originally impressed upon it; but that one original impression should produce such a variety of motions, and should give *matter* an active and truly self-moving power, is not, as I have shown *, supported by any experiment or observation, and is directly contrary to that *vis inertiae*, or perfect passivity, which they say is essential to *matter*.

I should think this mechanical system more compleat, if they made every thing mechanical, the animated, as well as the inanimate parts of nature. And, accordingly, the opinion of the French philosophers appears to me more consistent, who make animals to be machines; and, though they profess to confine this to brute-animals, I have little doubt but that the greatest part of them, at least, believe that man likewise is a machine; and one of them has written a book to prove it †. But our philosophers, who allow that the movements of men and other animals are produced, neither by mere matter and mechanism, nor by the immediate act of the Deity, but by some internal principle, call it *mind*, *life*, or whatever else you will, ought not, I think, to stop there, but to account for all the other motions they see in the universe, in the same manner—But of this I have said enough in the preceding book.

Thus, I have concluded what I have to say upon the subject of the Categories; the doctrine of which undoubtedly belongs to this science.

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* Page 282.

† Abbé du Prade, author of the book entitled, *L'homme Machine*.

of *first causes* and *principles* ; for these are either what is altogether immaterial, and not existing in matter, which, as I have said, is the proper subject of metaphysics, or what, though material, and existing in matter, is farthest removed from sense, and of highest abstraction, such as the Categories. And, accordingly, Aristotle, in his books of metaphysics, has explained some of them at great length, which he thought he had not sufficiently explained in his books of categories. And, indeed, the doctrine of the categories belongs so much to the *first philosophy*, that a considerable progress must have been made in that philosophy before they could have been discovered. Now, as the first philosophy was undoubtedly last in the order of invention, I am persuaded that every branch of philosophy had been cultivated, and every particular science brought, at least, to some degree of perfection, before men could have such enlarged views of things, as to arrange and divide into certain classes, that infinite variety of things which compose this universe. That Pythagoras, or his school, which lasted no longer than his life, should have carried philosophy and science so far, cannot be supposed. I therefore have not the least doubt but that this philosopher brought the doctrine of the categories with him from Egypt, and that it was there discovered, in the colleges of the priests, who appear to me to have carried philosophy and science of all kinds much farther than ever they have been carried since.

In the next book, I proceed to inquire concerning those adjuncts or concomitants of Nature, *time*, *space*, and *place*. These make the third head, under which I proposed to consider the universality of things. And I will begin with *time*.

B O O K IV.

Of the Adjuncts of Nature, TIME, SPACE, and PLACE.

C H A P. I.

Time, though not a Cause, a necessary Adjunct of the Material World—Time, like every thing in the Material World, dependent upon Motion—not to be comprehended at once, but to be investigated—Existence, Duration, included in the Idea of Time—Time a Measure of nothing but Duration—but not of the Duration of all Beings—only of such as are liable to Change of one Kind or another—What Kind of Measure Time is—It must be by Motion—This Motion must be perpetual, and it must revolve into itself, and begin where it left off—The Motion of the Celestial Bodies of this Kind—Definition of Time—Consequences of this Definition—Body, Motion, Number, must all join to make Time—How far Time participates of the Nature of Body—How Time applies to Mind such as ours—Moments not Time—nor any part of Time—Common Division of Time into present, past, and future—Nature of the present—properly speaking, has no existence—Time altogether of a most shadowy Nature—How Time is applied to Motion—Difference betwixt Time and Eternity—no Difference, according to the System of the Materialists—If the Universe be not eternal, and is to have an End, then Time must have had a beginning, and will have an End—Difficulty of Conceiving a Being whose Duration is not measured by Time—yet it is necessary so to conceive Divinity—What Plotinus says upon this Subject.

THAT time, though not a cause, is a necessary adjunct or concomitant of the material world, cannot be denied ; for every thing in it exists in time ; and the divisions of time, viz. past, present,

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and

and future, apply to it. It therefore belongs to this universal philosophy to treat of it.

If there were no *motion*, says Euclid, there would be no sound, nor any sense of hearing*—He might have added, nor any other perception of sense—Further, there would have been no visible world, nor generation or production of any kind here below—and, among other things, *time* could have had no existence. And this still further shews us the necessity of knowing what motion is, upon which so many things depend, and without the knowledge of which it is impossible to understand either physics or metaphysics.

Time is like motion, and many other things, which every body thinks he knows, and, indeed, has some notion of it, but very few perfectly understand. ‘If no body ask me what *time* is,’ says St Augustine, ‘I think I know; but, if any body ask me, I cannot tell.’ And, indeed, it is not easy to give a clear idea of time at once; but, in the following manner, I think, the definition of it may be investigated, and brought out by degrees, beginning with the most general of all ideas, *existence*.

If nothing existed, it is evident there could be no such thing as *time*.

Further, if there were no continuation of existence, there could be no *time*, because there would be nothing to which it could be applied. This continuation of existence is what is called *duration*.

Further, still, as *time* is acknowledged by every body to be a *measure* of something; and, as we can conceive it applied to nothing but *duration*, (for it cannot be applied to quantity, that is, to magnitude and

* Euclid, *señio Canonis in initio*.

and number, nor to quality, substance, or any other of the categories, considered absolutely in themselves, and without respect to *duration*), it follows, that *time* is the *measure* of duration.

But, can *time* be applied to the duration of all beings? Suppose a being altogether unchangeable, both as to its substance, and as to its qualities and energies—eternal likewise, as well as invariably the same—How can we conceive any measure of duration applied to such a being? The whole of its duration, being infinite, is impossible to be measured; nor can any period or state of it be measured, as there is no change or succession of states or of energies in such a being, by which any period of its existence can be marked and bounded. It remains, therefore, that only the duration of such beings can be measured as change, either in substance, or in their qualities or energies; and, if so, we can make the definition of *time* a little more particular, by saying, ‘That it is the measure of the duration of beings liable to ‘change or succession.’

Thus, we have discovered the *subjects* to which the measure of *time* is applied: But it remains to be inquired what this measure is, of what nature, and from whence taken.

As the things to be measured exist by change and succession, it is evident that the measure must be of the same kind: For the measure or standard must of necessity be like to the thing measured, otherwise it could not be applied to it. If, for example, it were magnitude that was to be measured, whose parts are continuous and co-existent, the measure must be of the same kind. Again, if the thing to be measured were number, whose parts are discrete, the measure must be number, or the common measure of number—*unity*. In like manner, when the thing has no parts co-existent, but exists only by succession, the measure must be of that kind; and, if it were a thing that existed wholly by change and succession, the more perfect measure it would be. Now,

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as was observed before*, there are only two things which exist in that way; *time* itself, concerning which we are inquiring, and *motion* †. Motion, therefore, is the measure we want; which, when applied to beings liable to change and succession, is *time*.

But neither is this sufficiently determinate—For, how is motion to be made a measure, so as to be applied to the subjects of *time*? This Aristotle has informed us of, by telling us, that we get the idea of *time*, by observing what is *first* and *last* in motion ‡: And, no doubt, the interval betwixt what is first and last, in the movement of any particular body, may be made a standard or measure, which will apply to any thing capable of being so measured. But, how are we to fix what is first and last in the motion of any body: Suppose the body moves in a straight line, we may determine what is first, if the line has a beginning which we know; and if it be not infinite, and that we know the end of it, we can also determine the last: But this will only be a measure while this motion lasts, and no longer; whereas *time* is understood to be a perpetual measure of duration.

In order, therefore, to make motion the measure we want, it is required, 1^{mo}, That the motion be perpetual. 2^{do}, That it revolve into itself, and begin again at the same point. 3^{tio}, That the *duration* of its revolutions be always the same. With these requisites, the motion of any particular body will be a measure of *duration*. But human art has hitherto contrived no such motion; nor has any natural motion been discovered, with these requisites, except the motions of the celestial bodies; and, therefore, men, in all ages and nations, have made *their* motions the measure of *duration*; particularly, the

* Page 171.

† Time, says Aristotle, cannot be its own measure; χρόνος ἢ ἀμετρεται χρόνον. Arist. Phys. lib. 4. cap. 15. § 7. For, if it were its own measure, what way could we define it?

‡ Arist. Physic. lib. 4. cap. 16. § 6.

the motions of the sun and moon, being the most conspicuous of those bodies *.

And now we have the full definition of *time*. 'It is the measure of the duration of things that exist in succession, by the motion of the celestial bodies.'

From this definition, several consequences are to be drawn. And, in the *first* place, as *motion* and *time* may be both divided into any given number of parts, so, by dividing the periods of the revolution of those bodies into any determined number of parts, we divide *time*, in like manner, into months, days, hours, minutes, &c.

2do, All the subjects to which *time* is applicable, are said to be *in time*, and are all, some way or other, affected by *time*. But it is evident, as was before observed, that beings, which suffer no change, neither in substance, qualities, nor energies, cannot be *in time*. Of this kind, we conceive Divinity to be; and, therefore, he is not *in time* but *in eternity*, or *αἰών*, as the Greek philosophers express it, by which is meant simply duration, or continuation of existence, but without being any ways bounded or limited. Of the same kind, are all things that, in any sense, may be said to be unchangeable and eternal; such as theorems and propositions of science; and, therefore, Aristotle very properly extends the observation to every thing eternal, and which continues always the same†. Of such things we should not speak with any distinction of *time*. But, as language was invented for the use of men conversant with things in generation and corruption, there is no verb of that kind in any language, as I have elsewhere observed ‡.

3tio,

* See Arist. phys. lib. 4 cap. ult. § 8. It has been doubted, I find, of old, whether the revolutions of the sun were all equal to one another, as Plutarch tells us, *De Iside et Osiride*, in initio.

† *τα αἰώρια*. Phys. lib. 4. cap. 19. § 7.

‡ Origin of Language, vol. 2. page 122.

3^{tio}, As there is no *time* without *motion*, so there is no *motion* without *body*. And there is a fourth thing which also must be considered, viz. *number*. For the revolutions of the motion, or the parts of that revolution, must be numbered. And hence it is that Aristotle has defined *time* not improperly to be *the number of motion* *. These four are all connected, but different. Body comes first in order, and is the leading idea, as, without it, there could not be motion. Next comes motion; by which we are to understand only one of the three kinds of motion before mentioned, viz. from place to place, expressed by one word in Greek, viz. *φορα*, for the other kinds of motion would not serve the purpose of a measure †; and not even all, as I have shown, of that kind. And to this motion, number applied, produces *time*. From this account, it is evident that *time* is an adjunct made to *motion* by the mind, through the application of number to it; for, without number, there can be no use or application of any thing to any purpose in human life. Moreover, as motion cannot be without body, nor *time* without *motion*, it is of necessity that both *time* and *motion* should participate of the qualities of *body*, from which they are derived. As body, therefore, is continuous, and infinitely divisible, so is *motion*, and likewise *time* ‡. But they are continuous in a different manner. For the parts of *body* are continuous, as co-existing and lying together. But, as in motion, the several parts of the body occupy several spaces, not at once, but by succession, one after another, it is necessary that the parts of *motion*, though continuous, should not be co-existent, but existent by succession; but they must be infinitely divisible, as the parts of the body moved are; and, as *time* is nothing but motion used as a measure, the same must be true of *time*.

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* *αριθμος τας κινήσεις*, Arist. Phys. lib. 4. cap. ult. § 7.

† Ibid. cap. 17. § 3.

‡ Ibid. cap. 18. § 7.

4to, As the general idea of motion will apply to such a mind as the human, where, though there be no change of substance, there is a change and succession of energies, we have from thence some idea of order, and of first and last, and likewise of an interval betwixt ; but, as we have no standard by which to measure that interval, it is not Time, but, as Aristotle has observed, only the first rude notion of Time. But, as I can apply it to the duration of things, and say, that a thing has lasted from the time I had one thought, till I had such another, it may be considered as some bound or limit set to duration, though not a determined one, such as Time *.

5to, As Time is duration bounded, and as it is infinitely divisible, it follows, that the bounds or terminations of the different portions of it are infinite in number. These bounds are called *moments* or *instants* ; and they are what points are in a line, which may be infinite in number, as the line is infinitely divisible. But it is well observed by Aristotle, that Time does not consist of instants any more than a line does of points † ; for an instant is no part of time, but the boundary of its several portions, in the same manner as a point is no part of a line, but the termination of it, or of any certain part of it ; with this difference betwixt the two, that a point has a situation, and is fixed ; whereas, an instant is continually moving, as the body is, from the motion of which Time arises ‡. It is, therefore, the intervals betwixt moments that are the parts of Time, as the intervals betwixt points in the same line are parts of that line ; and, as some geometers have conceived a line to be generated by the flux of a point, so we may conceive Time to be generated by the flux of an instant, which is therefore here and there, and every where, in Time.

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* See Arist. lib. 4. cap. 16.

† Ibid. cap. 17. § 7.

‡ Ibid. Phys. cap. ult. § 14.

6^{to}, The common division of Time is into *present*, *past*, and *future*. The present is the *now* instant ; which, like all the instants of time, is the beginning of one portion of it, and the end of another, as the same point in a line is the beginning of one portion of it, and the end of another. The *now*, therefore, stands betwixt the past and the future, being the end of the one, and the beginning of the other. But, as it has no parts, and is not time, it follows, that what we call the *present time*, is made up of so much of the time immediately before this *now*, and of so much of the time immediately after it ; that is to say, of so much of the past, and so much of the future ; so that, properly speaking, there is no such thing as *time present* *.

7^{mo}, It is therefore true what Mr Harris has said, that Time is a being of a most shadowy and unsubstantial nature, and which comes nearer than any other to no—being : For the past is no longer, the future is not yet, and the present has no existence ; he might have added, nor ever had : For there is this difference betwixt the past and the present, that the past had an existence ; and Horace says, that even the Divinity cannot make it not to have existed——

Non tamen irritum efficiet, insequumque reddet

Quod fugiens semel hora vexit——

and also, betwixt the present and future, that the future has a certain existence, potentially at least ; whereas the present neither
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* There are some words denoting the present, which take in a portion of either past or future. Thus, Aristotle tells us, *Phys. lib. 4. cap. 19. § 21.* that *νν* applies to any portion of time near to the present *now*, whether before or after it. Thus, I can say, *νν βαδισω*, or *νν βιβαδισα*. The same I take to be the signification of the Latin *mon*, and the English *now* ; for I can say *mon feci*, and *mon faciam* ; and, in English, I have *now* done it, and I shall *now* do it. In the same passage, Aristotle tells us, that *αγετι* is confined to the time immediately preceding the present *now* ; and, I think, it should be rendered in English by *just now*. When came you ? Just now ; which is in Greek *αγετι νλθον*. On the other hand, if I have a mind to express only the future time, nearest to the present instant, the word, in English, is *presently*. When will you do it ? *Presently*.

has had, nor *will have* an existence ; and is nowise distinguished from the *past* and *future*, but as a boundary betwixt the two ; which I have shown is no part of time, any more than a point is of a line.

Lastly, It is true what Aristotle observes *, that, as motion is the measure of Time, so Time is the measure of motion ; for, by applying Time to motion, we say, that one motion is quicker or slower than another, or lasts longer or shorter time than another. But it is to be observed, that, from motion, we must first have formed a measure of Time, before we can so apply it ; so that it is still true, that it is from motion only that Time originally proceeds. And, *2do*, The reason why Time can be applied to motion is, that it is of a nature perfectly similar, and therefore like measures like ; but it cannot be applied to magnitude, whose parts are co-existent ; nor to number, whose parts are discrete, unless by accident † ; as, when we say that a road is four hours long, or a number is four times as great as another, the meaning of which is, that the motion by which the journey is to be performed will continue four hours, and that the operation of multiplying the lesser number must be four times repeated in order to make it equal to the greater.

From these considerations, the truth of what I said in the beginning of this chapter is still further apparent, viz. that Time cannot be applied to any being of stable and permanent duration, without change or variation of any kind, but only to beings that are in a constant flux, and always changing, either as to their substance, or their qualities and energies. The common distinction, therefore, betwixt Eternity and Time appears to be well founded ; the former only applying to a being

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* Ibid. cap. 18. § 6. *et seq.*

† I use the word *accident* here in the sense that Aristotle uses the word *συμβεβηκος*, to denote a property that we ascribe to a thing that does not arise from the nature of the thing itself, but from something else which we consider as connected with it. Thus, the property of Time, which we ascribe to a road, does not belong to the road, *qua* road, but to the motion we make in travelling that road.

without change or variation of any kind ; the latter, to beings which exist only by succession, either as to their substance, or their accidents. Of the first kind, we conceive the Deity to be, whom we believe not only to have been from all eternity, but to be *without change, or shadow of change*. As to his eternity, it is admitted by all philosophers, that there never was a time when *nothing* existed ; but there always must have been *something*, otherwise nothing could ever have been. Whatever, therefore, the first cause or principle of things be, whether mind or matter, atoms or empty space, it must have been, according to the sentiments of the whole philosophers, from all eternity ; so that a Deity, or First Cause, of one kind or other, is admitted by all philosophers, and acknowledged to have existed from all eternity. Of the other kind are all material substances, which are in perpetual flux, and constantly changing, both as to substance and accidents. Those philosophers, therefore, whose Deity was matter, and who maintained, that nothing but matter existed in the universe, did not acknowledge any being of stable and permanent duration ; consequently, according to them, every thing existed in time ; and they did not acknowledge the distinction above mentioned betwixt time and eternity *. And one of these philosophers, viz. Heraclitus, said very properly, that every

* Democritus and Epicurus, who make a *vacuum* to be one of the principles of nature, did acknowledge this distinction ; because a vacuum, if it be any thing at all, is certainly a permanent and durable existence, without change or variation, at least while it continues a vacuum. But it is to be observed, in the *first* place, that a vacuum, by being filled with body, undergoes the greatest of all changes, for it passes from a state of existence to a state of non-existence. And this, according to their system, was constantly happening, by the perpetual motion of their atoms. 2dly, One, at least, of their principles of nature, was in perpetual flux and change ; so that, supposing their vacuum to be of permanent duration, the other principle was continually changing. Here, therefore, are two principles of things, of natures quite different ; the one fixed and immoveable, the other in constant motion. But the truth is, that, according to those philosophers, there is no fixed or permanent principle in nature : So that, according to them, time and eternity were the same, and every thing eternal ; but every thing unstable, without order or arrangement, constancy, or fixed duration.

ry thing flowed like a river, and that our apprehensions were such as the nature of things ; so that, as we could not bathe twice in the same river, neither could we have twice the same apprehension of the same thing. 2dly, Of this kind, likewise, are immaterial substances, whose qualities and energies are various and successive ; for to them Time may likewise be applied. But, though immaterial substances, in this way, may be the subject of Time, as well as material, yet, without body, and body moving by a motion revolving into itself, we cannot conceive any standard or measure of Time.

A consequence of the principles here laid down is, that, if the visible world had a beginning, and was not from all eternity, then, according to the hypothesis of genuine Theism, *time* was when there was no Time. And, again, if this world should be totally destroyed and annihilated, Time will be when there will be no *time*. For, in both these cases, there neither is a subject, to the duration of which Time can be applied ; nor is there any standard or measure for it. It is only, therefore, during the existence of the material world, that there can be such a thing as Time. But, though Time do then exist, it cannot be applied to the eternal and unchangeable Being, because he is not a subject whose existence can, in that way, be measured.

This, I know, will appear incomprehensible to most of my readers, and a contradiction in terms, that *time* was when there was no *time*. And it must be owned, that this notion is so remote, both from common apprehension and common speech, that it is not very easy to find words to express it, which do not seem, at least, to imply a contradiction. For our bodies, and the sensitive part of our nature, are so essentially connected with Time, and so necessarily carried on with it, that it is very difficult for us to conceive any notion of a timeless eternity, or of any Being whose duration is not to be measured in the same manner as ours is. But, if we are so far advanced in this philosophy,

as to form an idea of a being who is invariably the same, both as to substance, and as to qualities and energies, whose essence consists in action, and who can never suffer or be moved, and who had no beginning, nor can have any end, then we should clearly perceive, that, to such a being, it is impossible to apply time; for, how can infinite duration be measured? or, how can any part of that duration be distinguished from another, when all of it is the same, without any change or succession of any kind? Of a Being of such immutable perfection, it may, indeed, be said, in one sense, that *yesterday, to-day, and forever, are the same*; but it is only in a figurative sense; for, we are not to imagine it to be possible by nature, that these three periods of time should be accumulated and united into one; but, we are to understand, that the sameness and uniformity of the existence of this Being is such, that no distinction of time can be applied to it.

It is of the more importance to conceive the Deity thus unextended as to Time, that we shall thereby be better enabled to conceive him likewise unextended as to parts, place, and space. Betwixt these two there is a very great connection, as is most acutely and ingeniously observed by Plotinus, a philosopher of as great depth as, I believe, any that ever lived; sometimes of much greater depth than I can fathom. He has said, that, as we cannot conceive the Deity to be stretched out in Time, and divided into past, present, and future; so, neither can we conceive him to be extended in parts different from one another, and differently situated, and, by consequence, separable*. In short, we cannot conceive the Deity to be *magnitude*, that is, composed of an infinite number of magnitudes†.

Thus,

* See the passage quoted by Cudworth, p. 781.

† See also Simplicius's description of body or magnitude, *Μέγεθός τε μὴ ἄλλως ἢ σωματικὴ οὐσία πᾶσα ἀλλὰ μὴ ἀλλὰχού των μορίων κείμενην*. In Arist. Phys. p. 3. And Plotinus says somewhere, that body is *ἄλλο μετ' ἄλλο*. This is the best account I have ever met with,

Thus, I have finished what I have to say of *time*, a subject which undoubtedly belongs to this universal science; for the universe exists in it. It began with the universe, and can never end but with it. It is, in short, a necessary adjunct of nature, without which no visible world ever could have existed.

CHAP.

with, of that wonderful and most mysterious unity and perfect indivisibility of the Godhead, which must be extended to his duration as well as his substance. And, as Plotinus has observed, in the passage above quoted, this manner of existing is the most perfect that can be conceived; more perfect, I doubt, than human intellect can form a clear idea of. Nor do I think we can do more than perceive the necessity of the most perfect Being existing in that manner; for, I think, we clearly see the impossibility of his duration being in a constant flow like a river, and one moment hurrying to overtake another, and always something still to come; so that nothing is perfect or complete. However difficult it may be, therefore, to conceive it, yet the necessity is apparent, that his duration should be shut up and included in eternity, in the same manner as his substance must be altogether and within itself, not divided into parts, one of which lies here, one there; and these parts again infinitely divisible.

C H A P. II.

*Space taken in two Senses, a larger and a stricter—The Inquiry here concerning Space in the stricter Sense, that is, void of Body—Different Opinions concerning Space—considered by some as different from Body and Mind, and as a kind of Rival to Deity—Space considered upon the Supposition of Nothing existing—Then Space is nothing but the mere Capability of receiving Body—In what Sense Space can be said to have the three Dimensions—Space considered likewise upon the Supposition of Deity existing from all Eternity, but not the Material World—Upon that Supposition, likewise, Space nothing but mere Potentiality—Lastly, Space considered upon the Supposition of the Existence of the Material World—Upon that Supposition, it has no Existence but in Relation of Body, and that in three Respects—but absolutely, in itself, a mere Non-entity—Place is nothing but Space filled with Body—From thence arises a short Definition of Space, viz. that it is Place, *divapen*, or in Capacity.*

SPACE, taken in the most general sense, comprehends whatever is extended, and may be measured by the three dimensions, *length, breadth, and depth*. In this sense, it is the same with extension. Now, Space, in this large signification, is either occupied by body, or it is not. If it be not, but is void of all matter, and contains nothing, then it is Space in the strictest signification of the word, and as it is commonly used in English philosophical language, being the same with what is called a *vacuum*.

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Whether there be any such thing in Nature as *space*, in this sense of the word, is a question that does not belong to this part of my work, but will be treated of in the second part ; the subject of which is *Nature* : And I am only to inquire here, what the nature of *space* is, and what notion we ought to have of it, upon the supposition that it exists.

This inquiry is more necessary, that it seems to be considered by many of our modern philosophers as something entirely distinct, both from *body* and *mind* : So that, according to them, I have been hitherto mistaken in supposing, that all things are either *body* or *mind*. Some of them seem to consider it as a kind of rival to Deity ; for they ascribe to it no less than four attributes of the Deity, *eternity*, *immobility*, *infinity*, and *necessary existence* ; and others of them have gone so far as to make Deity, in some sense, dependent upon *space* ; for they tell you, that *infinite space* is the *sensorium* of the Deity ; by which, if they mean any thing, they must mean, that it is by *space* that the Deity perceives, as we do by organs of sense. It is therefore worth while to inquire, Whether *space* be entitled to this rank and precedence in Nature ? or, Whether it be not the meanest thing in Nature, if any thing at all—and such as cannot, in any sense, be called a *cause* or *principle* of things ?

Let us suppose, however extravagant and absurd the supposition may be, that *time* was when *nothing* existed, neither *body* nor *mind*, *substance* nor *accident* ; still, however, there would be *space* and a *vacuum*, such as in an exhausted air-pump, but without bounds or limits. I desire to know, What sort of being this *space* is ? It certainly is not *substance* ; neither is it *accident* ; for, Of what should it be the *accident* ? Is it then *nothing* ? It is, in one sense ; for it is nothing *actually* existing ; but it is something *potentially* ; for it has the capacity of receiving *body*, for which it furnishes *room* or *place*. It

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has, therefore, a *potential* existence, of a very singular kind ; for other things that exist *potentially* have the capacity of becoming *something*. Thus, wood, for example, has the capacity of becoming a chair or a table ; brass the capacity of becoming a statue or a vase ; and the first matter has the capacity of becoming every corporeal thing : But *space* has not the capacity of *becoming* any thing, but only of *receiving* any thing. In short, it is not, nor cannot become any thing itself, nor hath any actual existence ; but is that without which nothing corporeal could exist. It is not, therefore, a cause, in any sense of the word ; for it is not the *material* or *formal* cause of any thing ; neither is it the *efficient* or *final* ; but it is merely *passive* of the existence of body.

It may be objected, that we can conceive *space*, in such a case, to be measured by yards and feet, as well as *body* ; therefore something more may be predicated of it than merely being the *receptacle* of *body*, viz. that it is capable of being measured, and that it has the three dimensions ; but this is only a consequence of its capability to receive *body* ; for *body* must be in it before it can be measured ; for it is only by the application of *body* to it that it is measured ; and, being applied to it, it is of necessary consequence that its dimensions should correspond with the dimensions of *body*, because it surrounds and bounds *body*. It is not, therefore, speaking properly, to say, that *space* has the three dimensions, as these belong only to *body* ; and *space*, as surrounding *body* ; does no more than correspond to these dimensions.

Space, therefore, upon the supposition of its being the only thing existing, is nothing but the capacity of receiving *body*, whenever it shall exist ; and it is perfectly *passive* of *body* ; not only receiving it, but letting it pass through it, without the least resistance. And this is one difference, among others, betwixt *matter* and *space*, that *matter* is essentially and necessarily existing, or *antitypus*, as the Greek philosophers

phers expressed it ; whereas, *space* is perfectly yielding, and unresisting.

But, let me make another supposition, not extravagant or absurd, that *body*, and all the visible world, had a beginning, and that once nothing existed but that Being which is alone of necessary as well as eternal existence ; *space* would then exist likewise ; but it would then be no more than what it was upon the other supposition, viz. a capacity of receiving *body*. But it is said that, upon this supposition, it is eternal, or necessarily existent, and immoveable, as well as the Deity. And, in this way, certain free-thinkers endeavour to put it upon a footing with Deity. But, as to eternity, it is evident that the capacity, or *potentiality*, as it may be called, of every thing, must have been from all eternity. Every thing that now actually exists, must, upon the supposition I now make, have once existed in the ideas of the Divine Mind, that is, only in capacity. And, for the same reason, what was necessary for receiving and admitting them, after they were created, must necessarily have existed also, otherwise the things themselves were not capable of existing. For the same reason, it is evident, that space must be of necessary as well as eternal existence, being the receptacle of things which could not otherways have existed. And, as to its being immoveable, it has that in common with every thing which is not *body* ; for every immaterial substance, every idea, every form, and every capacity of existence, cannot, by its nature, be moved. And, as to what is commonly said, that God fills *infinite space*, it is speaking very improperly of God, as if he were a material substance that could occupy *space*. And, to say, that space is the *sensorium* of the Deity, is still a more improper expression, as it supposes that the Divinity could not perceive but in the manner we perceive objects of sense, that is, by the means of organs of sense.

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But, laying aside all suppositions, I come now to what is the fact, namely, that a visible world exists; and I will suppose that, in this world, or without it, there may be such a thing as a *vacuum*, or *space*, void of *body*. What shall we say of such *space*? The same, in my opinion, that we said of it upon the former supposition, viz. that it is the *receptacle* of *body*. From thence result, upon this last supposition, two other properties of *space*, namely, that it marks the interval or distance betwixt *bodies*; and, *secondly*, that it bounds and limits them.

As to the first, if we suppose several *bodies*, not continued or joined together, to be contained in *space*, it follows, of necessary consequence, that there must be *space* betwixt them; which *space* is called *interval* or *distance* betwixt *bodies*. And, as to the other, it is likewise evident, that the superficies of all *bodies* must be bounded by *space*; for, if they were not so bounded, they would be infinite. And, if we suppose the whole collection of *bodies* that constitute the universe not to be infinite, but bounded, it is evident that the boundary can be nothing else but *space*. It is true, indeed, that this *space*, which we suppose to be on the outside of the world, is infinite; but, for that reason, to compare *space* with the Deity, is as absurd as it is impious; for, to say that *space* is infinite, is saying no more, than that there is room for more creation, and more worlds, if it shall please the Almighty to make them.*

To conclude, therefore, from all these different views in which *space* has been considered, it is evident, that it is nothing else but a *relation*; and it is relative to *body*, and to *body* only; and this in three respects;

* In what sense the Deity is infinite, and how his infinity is to be distinguished from the infinity of other things, will be explained in the second part of this work.

respects; *first*, as to its capacity of receiving *body*; *2dly*, as to its bounding or limiting *body*; and, *lastly*, as to its being the distance betwixt *bodies* that are separated. And, except those relations to *body*, it is, in every other respect, a mere non-entity. Whatever, therefore, has been said of it, as of a thing existing by itself, that is, a substance, or as quality, quantity, or belonging to any other category, except *relation*, is without any ground, and is the error of those who have not studied universals, nor have been taught to distinguish accurately betwixt the several things of which this universe is composed.

After I have said so much of *space*, what I have to say of *place* is very short. It is, according to my apprehension, nothing but *space* occupied by *body*, according to the distinction with which I set out in the beginning of this chapter, betwixt *space* void of *body* or *vacuum*, and *space* filled with *body*. *Place*, therefore, according to this definition, is different from *body*, as that which contains is different from that which is contained. If there be no *vacuum* round the *body*, but other *bodies*, then is the *body* not bounded by *space*, but by the circumambient *bodies*. And, if there be no *vacuum* in Nature, this must be the case of all *bodies*; and, if so, the *place* of every *body* must be bounded by the circumambient *bodies*. And, as Aristotle holds that opinion, he accordingly has so defined *place* *.

From this account of *place*, we are enabled to give a shorter definition of *space* than what has hitherto been given, namely, that it is *place* *divine*, or *potentially*; and, when it is filled with *body*, then it is *place* *actually*, or *essentially*. This is only expressing, in fewer words, what

* το πρῶτον τοῦ περιέχοντος σώματος. De Naturali Auscultatione, lib. 4. cap. 6. *versus finem*.

what I said before, that *space* was what was capable of receiving or admitting *body*, or the capacity of being filled with *body*, that is, becoming *place*; for the capacity or power of becoming any thing, is that thing *potentially*.

CHAP.

C A A P. III.

Leibnitz's Definition of Space—and of Time—erroneous as to both, but altogether erroneous as to Space—Absurd Consequence of these Errors—Dr Clark's Opinion concerning Space—The Consequence of the Doctor's Opinion is, that Space is an essential Property of the Divine Nature—Unable to answer Mr Leibnitz's Objection to his Notion of Space—The Ground of the Doctor's Error—The Ground of the Error of both.

WHAT I have said concerning *space* in the preceding chapter, would, I am persuaded, appear unsatisfactory to the reader, and he might perhaps think me a supercilious contemner of modern philosophy, if I should not examine the different notions of *space* delivered by Dr Clarke and Mr Leibnitz, in those famous letters that passed between them concerning the principles of natural philosophy.

Mr Leibnitz there asserts, that *space* is nothing else but the order of things co-existing, as *time* is the order of things successive.

That *time* is the order of things successive, is so far true, that there is order in *time*; for there is *first* and *last*. But, it is evident that Mr Leibnitz, who was not learned in Greek philosophy, did only discover a part of what had been discovered by Aristotle about 2000 years before, concerning *time*. And, I believe, that will be found to be the case

case of every man in later times, who has pretended to philosophise without the assistance of the antients. And it is well if they have discovered any part of the truth, and have not been altogether in an error, while they thought they were making great discoveries. This is not the case with Mr Leibnitz; for he was right in two things; *first*, that there was order, or *first* and *last*, in *time*; and, *secondly*, that it applied only to things in succession: But he did not know, that the idea of *time* was taken from *motion*, and that, though it was necessary to observe the order of the *moving body* in its progress, and what preceded in that progress, and what was subsequent; yet, it was not that order, by itself, which constituted *time*, but the interval betwixt any two points in the progress of the motion.

But I cannot say so much for Mr Leibnitz, with respect to his doctrine of *space*; for there he appears to me to have missed of the mark intirely, *space* not being the order of co-existents, but a thing altogether different.

By *order*, in this definition of *space*, Mr Leibnitz does not mean the same kind of order by which he defines *time*; for that order is numerical order, by which things are *first* or *last*, *second*, *third*, or *fourth*, &c. This order, like number itself, hath nothing to do with position; whereas, the order that he applies to *space*, is, as he himself has explained it, an order of *position*, that is, situation or arrangement, by which things are placed in a straight line, or a curve, in the figure of a *triangle*, *square*, *pentagon*, &c. Now, that order of position is not *space*. It is true, indeed, that bodies, placed in any kind of order, must necessarily be *in space*; but the order in which the *bodies* are placed, and the *space* in which they are placed, must necessarily be distinct.

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This erroneous notion of Space has led Mr Leibnitz to the absurdity of saying, that, supposing the whole system of the visible world to be moved out of the place which it presently occupies, into some other portion of Space, beyond the limits of this universe, still it would be in the same Space, provided the order and arrangement of the bodies, with respect to one another, was continued the same. And his imperfect notion of Time has made him say, that, if the world had been created a thousand years sooner, it would have been created at the same time, provided there had been the same order of successive things.

This is the opinion of Mr Leibnitz concerning Space—Let us next examine that of his antagonist Dr Clarke. He has not given us any precise definition of Space; but he has told us, *first*, That it is something, and not absolutely nothing. *2dly*, That it is not an idea merely, but has some real existence. *3dly*, That it is not the bare relation of one thing to another, arising from their order or situation among themselves. *4thly*, That it is not Body. *5thly*, That it is not substance of any kind: And from thence he infers, that it is a property or accident*; and, as what is an accident must, of necessity, be accident of some substance, he has said that it is an accident or property of God†.

In examining this opinion of the Doctor, which appears to me altogether new, and, if there be any truth in it, a discovery made by the Doctor himself, let us first inquire what is meant by saying, that any thing is *property* or *attribute* of a substance. And the meaning

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* Page 305. of the Collection of these Letters in French and English.

† Ibid. page 77. 127. 129.

I take to be no other than this, that it is a quality inherent in the substance. If it be such a quality, that the substance cannot exist without it, then it is what we call an *essential property*; but, if it be only such a quality of the substance, that it may be away, and yet the substance exist, then it is said to be an *accidental property*, or an accident, in the strictest sense of the word. Now, of this latter kind, it will be admitted, that there is nothing in the Divine nature, but, that all the qualities which we ascribe to Deity are *essential* attributes, existing necessarily, as well as the substance to which they belong. If, therefore, it be true, that Space is a property of the Deity, it must be an essential part of the Divine Nature.

Against this opinion of the Doctor, I think Mr Leibnitz argues well, when he says, that if Space, in general, be part of the Divinity, so must every part of Space. And this Divine attribute must be divisible into an infinite number of parts. Nor do I well understand the Doctor's answer, when he says, that Space is indivisible except in idea; for, though it be not divisible, like matter, the parts of which can not only be bounded and distinguished one from another, but discripted, or separated one from another, which the parts of Space cannot be, it is likewise true what Mr Leibnitz says, that, by lines drawn, or superficieses interposed, the several parts of Space may be actually divided and distinguished one from another.

Further, if Space be an essential attribute of the Deity, Why should not Matter, which fills that Space, be also a part of the Deity? for, however low or vile a thing Matter may appear to be, it seems to be of greater dignity and eminence than that which only contains it; for, out of Matter, as I before observed, joined with Form, all the different Specieses of corporeal things are made.

What

What appears to have led the Doctor into this error, was his scruple to allow any thing to be of eternal and necessary existence, as Space undoubtedly is, which was not entirely dependent upon Deity, and part of his Nature. But, if the Doctor had understood that Space was nothing absolutely in itself, but only relative to Body, and, therefore, that it had no actual existence, but existed only *potentially*, or in *possibility*, till Body was created, he would easily have got over that scruple, and have seen, that this possibility of Space existing, was no more part of the Divine Nature than any other possibility, and, indeed, than the whole visible creation ; for, if the world was not eternal, it existed once only in the idea of the Divine Mind, that is, in *possibility*. And the foundation of the error, both of the Doctor and Mr Leibnitz, upon this subject, appears to me to be this, that they have not known or attended to that distinction which runs thro' the whole antient philosophy, betwixt what *actually* exists, and what exists only *potentially*. Every thing existed in this latter way, in the Divine Mind, before creation or production ; and it might as well be pretended, that every animal and vegetable made part of the Divine Nature, as that Space does.

It must, however, be confessed, that Doctor Clarke has come nearer the truth than Mr Leibnitz, and has avoided all the absurdities that Mr Leibnitz has fallen into, in consequence of his notion of Space. The Doctor also was in the right in denying that Space was nothing more than the relation of one thing to another, arising from their situation or order among themselves ; but he should, at the same time, have observed, that Space was relative to Body in general, and that, without Body, it had no actual existence, but was like all other things which exist only in idea or possibility.

And thus much of Space and Place, which are undoubtedly universals, making part of the system of this universe ; for, though they

be not principles or causes, in any sense, yet they must necessarily have been, otherwise there could have been no system of nature, nor any visible world.

In my next Book, according to the method I have proposed, I will proceed to treat of the general principles of Science, and of the nature of Truth and Evidence.

BOOK

B O O K V.

Concerning the Principles of SCIENCE, and of TRUTH
and CERTAINTY.

C H A P. I.

The Principles of all Arts and Sciences to be found in Metaphysics—It belongs to Metaphysics to explain the Principles of Science, and to defend them against the Cavils of Sophists—Truth Logical and Metaphysical—Logical Truth or Propositions the Subject of this Chapter—Propositions analyzed—In all Propositions, one Term at least must be a General or Idea—Division of Propositions into those which have both Terms general, and those which have only one.

IT has been often said, in the course of this work, that it is in the first philosophy that we are to seek for the principles of all arts and sciences: And, indeed, it is a matter of common observation, that every deep disquisition, upon any subject, ends in metaphysics. This I shall afterwards show more at large, and prove by particular examples. But, in this chapter, I propose to inquire what is the principle of all science and demonstration of every kind—an inquiry which, I think,

think, necessarily precedes the other ; for, it will be impossible to show that the principles of particular sciences are to be found in metaphysics, if we cannot show that it is to that science we owe the knowledge of *what science is*, and that it is from the principles which it furnishes, that we are able to establish the certainty of science, and to defend it against all the cavils of sophistry ; for there have been, in ancient times, as well as modern, men, who have endeavoured to shake the foundations of all human knowledge : And, accordingly, we see that Aristotle, in his books of metaphysics, argues much against men of that kind, who, in his time, denied even the truth of axioms.

What Truth is, was a question asked at our Saviour by the Roman Governor, but which is not answered ; nor, indeed, was it necessary to answer it, the nature of truth being discoverable by our own faculties, unassisted by revelation, as well as the language, by which truth is enunciated, and the other arts of life. It is, however, a discovery that does not seem to have been made, at least, by the philosophers of Greece, till Aristotle wrote his books of Analytics, the professed design of which is, to show what Science or Demonstrative Truth is.

The Truth, of which I am here to treat, is what is called *Logical Truth*, being perceived by the act of the mind, comparing together its own ideas or perceptions ; and it is distinguished from what is called *Metaphysical or transcendental Truth*, which belongs only to single ideas ; for, if the idea be agreeable to Nature, the source and origin of all our ideas, and, if it involve no contradiction, such as the idea of a round square would involve, it is said to be a true idea. In the same sense we may say, that any piece of human workmanship is *true work*, being conformable to the idea in the mind of the artist. And, in a like sense, we say, that the works of Nature herself have Truth in them, as they are conform to the ideas in the Divine Mind. And this truth is the

the same with that *goodness* which is mentioned in Scripture, where it is said that 'God saw that his works were good,' 'answering his 'fair idea,' as Milton has very well paraphrased it.

As to the Truth of which I am speaking, it is evident, *first*, That there must be a Mind which perceives it; *secondly*, That there must be perceptions in this Mind, which are compared together; for it is this comparison or combination which makes what we call a *proposition*; and it is the truth of propositions that is the subject of our present inquiry. These perceptions, thus combined together in propositions, are what we call, in logical language, the *terms* of the proposition; and the one of these terms is said to be affirmed or denied of the other; so that every proposition is either affirmative or negative; and what is affirmed or denied is called the *praedicate* of the proposition; and the term of which it is praedicated or denied, is the *subject* of the proposition: So that every proposition necessarily consists of a praedicate and a subject*.

All

* According to the common use of language, it is sometimes not very obvious which is the praedicate of the proposition, and which is the subject. In the natural order of things, the praedicate should go before the subject; whereas, commonly, in English, it is just the contrary; for we say, *God is just, Man is unjust*; where the praedicates, *just* and *unjust*, are put last, and the subjects, *God* and *Man*, first. In the learned languages, it may be either way; but, according to Aristotle's manner of analyzing these propositions, the praedicate is always placed first; and, if the proposition be affirmative, it is joined with the subject by the preposition *κατα*. Thus, the two propositions I have mentioned, he would express in this way, δικαιοσυνη κατα Θεου. 'αδικια κατ' ανθρωπου. And it is from this use of the preposition, that the term *κατηγορουμενον*, which is the Greek name for the praedicate, and *κατηγορια*, are derived. Again, if the proposition be negative, the praedicate is connected with the subject, according to Aristotle's analysis, by the preposition *απο*, or, *ου κατα*, as *αδικια απο του Θεου*, or, *ου κατα του Θεου, God is not unjust*.

This

All the perceptions of the human mind are either ideas or perceptions of sense, that is, they are perceptions, either of generals, or of particular

This way of analyzing propositions into their praedicate and subject, is, I think, useful, especially when the proposition is much involved, which is the case when the praedicate, or subject, or both, are expressed, not by one word, but by several words, perhaps several sentences: For, though Man, for example, be the subject of a proposition, yet, it may be man, in such circumstances, as will require several sentences to express. And, in like manner, what is praedicated of Man, may be a thing that cannot be expressed, except in many words; yet, for all this, the proposition is but one simple proposition. And this happens, not only in propositions requiring proof, but in axioms or self-evident propositions, which one should think the simplest of all propositions; as, for example, in the first axiom of Euclid, that things equal to the same thing are equal to one another, *Equality* is predicated, not of any two or more things in general, but of two or more things that are equal to the same thing: So that here the subject of the proposition cannot be expressed without several words.

The expression of our English language is so imperfect, that we often cannot distinguish whether the proposition be affirmative or negative; whereas, in Greek, that is clearly distinguished by the arrangement of the words. For example, ἀνθρωπος ἰστίος ἐν δυνάμει, is an affirmative proposition, the praedicate of which is, *not just*, that being affirmed of Man; whereas, ἀνθρωπος οὐκ ἰστίος ἐν δυνάμει, is a negative proposition, the praedicate *just* being denied of Man. And the reason of the difference is, that the negative οὐ being prefixed to δυνάμει, is understood to be joined with δυνάμει, so as to make the praedicate of the proposition ἐν δυνάμει, *not just*; whereas, when it is prefixed to the verb ἰστίος, it is construed with that verb, and makes the proposition negative. But, in English, as we cannot put the negative before the verb, but only after it, we can only say, *Man is not just*, which is altogether ambiguous, and may be understood, either as an affirmative or a negative proposition. In this instance, the sense is pretty much the same, whether the proposition be considered as affirmative or negative; but, in other instances, the difference will be very great; as, for example, ἀνθρωπος δυνάμει ἐν τρεχέει, is an affirmative proposition, where the capacity of *not running* is affirmed of Man. But ἀνθρωπος οὐ δυνάμει ἐν τρεχέει, is a negative proposition, which denies that the capacity of *running* belongs to Man; yet, in English, we can express these two propositions, so different in their sense, only in one way, viz. *Man cannot run*; and, for the

ticular thing. Of the first kind of propositions is made what we call *science* or *demonstration*. From the second kind arises another sort of evidence, which I shall explain in the sequel: But I will begin with the propositions of the first kind.

CHAP.

C H A P. II.

Common Sense not sufficient for explaining the Principles of Evidence or Certainty—nor any Learning to be found in English or in French—Mr Locke's own Account of his Essay—His Mistake of the Axiom of the Schools, upon which he builds his whole Work, is a fundamental Error of his Book—Of General Propositions, that is, Propositions of which both the Terms are general—Mr Locke's Account of the Truth of such Propositions very imperfect—The Relation betwixt the two Terms of the Proposition, such as is necessary to make the Proposition true, particularly explained—All Propositions either affirm or deny a Genus of a Species, or an Accident of a Substance.

THOSE of my readers, who are not learned, will be surprised to find that so many distinctions, and nice discriminations of things, are required to inform them what Evidence is ; and they will be apt to say, what an English Judge said to a Jury, who asked him that question, ' That every thing is Evidence which they think is such.' *Common sense*, they will say, is sufficient to let us know what Certainty and Conviction are, and when we ought to be convinced, and when not. But I will tell them, that, not only *common sense* is not sufficient for this purpose, but even the most *uncommon sense*, and the greatest natural genius ; and that, in order to know what truth and science are, they must either have invented themselves a great system of science, such as Aristotle has delivered in

his books of Analytics, or they must have learned it from others. And I will further add, that, if they are to be taught, it must be by good masters, living or dead. As to dead masters, I mean authors who have written books upon the subject, I am afraid there are none either in English or French, that will much instruct them. Our only standard book of the philosophy of Mind is Mr Locke's Essay upon the Human Understanding, of which he is so modest as to give this account in his preface, 'That some hasty and undigested thoughts, on a subject never before considered, gave the first entrance to his Essay; which, begun by chance, was continued by entreaty, written by incoherent parcels, and, after long intervals of neglect, resumed again, as humour or occasion permitted.' That there should be any degree of perfection in such a work, cannot be expected. And, indeed, to a man of learning and philosophy, it appears no other than a hasty collection of crude undigested thoughts, by a man who thought and reasoned by himself, upon subjects of the greatest difficulty, and deepest speculation, without the assistance of learning; for, that he was not an antient scholar, or learned in antient philosophy, is apparent. And, in his time, there was hardly any thing in French and English books that deserved the name of philosophy; and the philosophy of the schoolmen was then almost entirely out of fashion. He has, however, adopted one maxim of it, and made it the foundation of his whole system; but a maxim absolutely false, in the sense in which he has understood it. The maxim I mean is, that *Nihil est in intellectu quod non prius fuit in sensu* *. Upon the credit of which, he has confounded sensations and ideas, generals and particulars. But it is no maxim of Aristotle, who has every where most carefully distinguished betwixt sense and intellect, and, consequently, betwixt their different objects, sensations and ideas. And, though I believe the schoolmen meant it in

* See what I have said of this maxim, p. 113. where I have observed, that, though it be not true of the *intellect*, it is true of the *phantasia*.

in no other sense, but that, in this state of our existence, we have, from our senses, the materials upon which intellect operates and forms its ideas, they have, no doubt, expressed it ill, and in such a way, as to lead Mr Locke into a capital error, so that he does not appear to have profited by the little learning he had ; we must, therefore, if we have a mind to be well instructed in this philosophy, go, not to Aristotle's interpreters, the schoolmen, who knew nothing of him except by Latin versions from the Arabic, but to Aristotle himself, and his Greek interpreters of the Alexandrian School, who not only had the use of books that are now lost, but appear, to me, to have had preserved among them a traditional knowledge of his philosophy. From Aristotle, with the assistance of these interpreters, I am now to deliver what I think necessary for explaining the nature of Science, and Certainty, and Evidence of every kind.

Having premised thus much, I proceed, according to the distinction that I have made of propositions into general and particular *, beginning with general, by which we compare together generals or ideas ; for, as I have elsewhere observed, all our knowledge, in this state of our existence, is *comparison* ; for, by comparing particular things, we acquire ideas, by comparing ideas we form propositions, and, by comparing propositions, we reason and syllogize.

As

* This is a division of propositions made by Aristotle, in the following words, which I quote the rather that they establish, beyond all doubt, his belief in the distinction betwixt generals and particulars, a distinction that I hold to be the foundation of all philosophy. Επει δ' εστι τα μιν, καθολου των πραγματος, τα δε καθ' ικαστον. λεγω δε καθολου μιν, ο επι πλειονων πιφυκε κατηγορησθαι καθ' ικαστον δε ο μη, οισιν ανθρωπος, μη των καθολου, Καλλιας δε των καθ' ικαστον αναγκα δε αποφαινεσθαι ως υπαρχει τι η μη, οτι μιν των καθολου τι, οτι δε των καθ' ικαστον—Arist. *De Interpretatione*. And he further says, that, without generals, there can be no demonstration. *Analytic. Poster. lib. 1. cap. 1. in initio*. So that those who maintain that there are no generals, do consequently maintain, that there is no such thing as demonstration.

As we have very many ideas of very many things, it is impossible but that our ideas must have some relation one to another; and it is this relation which makes the truth or falsehood of any proposition. But what is this relation? If we can find out this, then we shall know what *truth*, and its opposite, *falsehood*, is. All that Mr Locke has said upon the subject is, that truth consists in the perception of the agreement or disagreement of our ideas, meaning, I suppose, by the agreement, an affirmative proposition, and, by the disagreement, a negative proposition. But we are very little the wiser for knowing this, unless we know, at the same time, what kind of agreement it is that makes a true affirmative proposition, and what kind of disagreement a true negative; for it will presently appear, that it is not every kind of agreement or disagreement that makes a true proposition.

And, in the *first* place, in every true affirmative proposition, and, indeed, in every proposition, one of the terms, as we have seen, must be the *praedicate*, the other, the *subject*. Here, therefore, is so far a disagreement of the ideas in a true affirmative proposition. The two terms of the proposition may, indeed, be the same, making what is called an *identic proposition*; but that is truly no proposition at all, being only a repetition of the same thing; as, when we say, 'A man is a man,' 'An animal is an animal,' 'A triangle is a triangle.' Nor will it alter the case, if we express the meaning of one of the terms by several words, as, when we say, that man is a rational animal, capable of intellect and science; or, that a triangle is a figure bounded by three lines; for that is only explaining the meaning of the word, which is a *definition*, not a *proposition* *.

Those,

* The difference betwixt a definition and a proposition is, that the definition only tells us what the thing, expressed by the word, is, without affirming or denying any thing of it; whereas, a proposition affirms or denies something of it. See *Aristotl. Analytic. Poster. lib. 1. cap. 10. in fine.*

Those, therefore, who would prove the truth of all propositions, even of axioms, by reducing them to identic propositions, do not, I imagine, know what they would be at.

In order, therefore, to find out what kind of agreement or disagreement of the *praedicate* with the *subject* makes a true proposition, we must try to discover the several relations that a *praedicate* can have to a subject; for it is evident that, in every true proposition, there must be a relation of one kind or another betwixt the *praedicate* and *subject*: Now, these relations may be reduced to two general heads, the relation of *Genus* and *Species*, and that of *Accident* and *Substance**; for all propositions must either praedicate the *genus* of the *species*, as when we praedicate *animal* of *man*, *horse*, or *dog*; or the *accident* of the *substance* in which it is inherent, as when we praedicate the colour, *white*, of any *animal*; and it is only in one or other of these two ways that any thing can be praedicated of another †.

And

* The way that Aristotle, in the second chapter of his *Categories*, expresses these two relations, is, by saying, that the first is κατ' ὑποκειμένου, when the genus is praedicated of the species as a subject that is under it; and the other, he says, is ἐν ὑπκειμένῳ, when the accident is praedicated of the substance, as being in it, and not having any existence without it; for that is the true distinction betwixt συμβεβηκός, or *accident*, and οὐσία, or *substance*; substance existing by itself, and not in any thing else; whereas accident cannot subsist by itself, but only in substance.

† Ammonius, in his commentary upon the *categories*, page 59. observes, that there are three ways of praedicating; the one, he says, is κατὰ φύσιν, or *natural*; the other, παρὰ φύσιν, or *unnatural*; and the third is, κατὰ συμβεβηκός, or, *by accident*. Of the first kind of praedication are the two I have mentioned, viz. when the *genus* is praedicated of the *species*, or the *accident* of the *substance*. What he calls the *unnatural* praedication is, he says, just the reverse of this, as, when we praedicate the *substance* of the *accident*, or the *species* of the *genus*, or, what is the same thing, the *individual* of the *species*. Of the first, he gives this example, το φιλοσοφουν τουτο Σωκρατης ἐστι. Where Socrates, the *substance*, is praedicated of the quality *philosopher*. But this unnatural praedication is plainly resolved into one that is natural; for the proposition comes just to this, that the substance *philosophising*, and the substance called *Socrates*, are the same; that is, the genus *identity* is praedicated of the particular relation.

And here, again, we may see, that, in a true affirmative proposition of the first kind, when the genus is praedicated of the species, there is a very great *disagreement* betwixt the two ideas, in this respect, that the one comprehends or contains the other; whereas, the other is contained under it, as the part is under the whole; for that is the relation which genus and species have to one another; the genus, *animal*, for example, comprehending *man*, *horse*, *dog*, &c. as parts of it. Again, in the other way of praedicating, where an accident is praedicated of a substance, the *disagreement* is very great; for the accident is inherent in the substance, and cannot exist without it; whereas, the substance

relation that is betwixt *Socrates* and the *philosophising substance*. The instance he gives of the other is, when we say, 'That this man is *Socrates*;' where, says he, we praedicate *Socrates*, the individual, of *man* the species, instead of praedicating in the natural way the species *man*, of *Socrates* the individual. But this proposition is likewise resolvable into a natural praedication of the same kind; for the plain meaning of the proposition is, that a particular *substance* belonging to the species *man* is the same with the *substance* called *Socrates*. The third manner of praedicating is, he says, when *accident*, instead of being praedicated of a *substance* in the natural way, is praedicated of another *accident*, of which he gives this example, speaking of *Socrates*, το φειλακρον τωτο φιλοσοφει εστι. 'This bald thing is a philosopher.' But the resolution of this into a natural praedication is still more obvious: for it is saying no more than that the *substance*, which is *bald*, has the quality of philosophising, where the quality, in the natural way, is praedicated of the substance. This is plain in the English translation, where we must use the word *thing*, which, in such an expression, can denote nothing but substance; whereas, in the Greek, where the article supplies the place of any noun, it is not so very obvious. In English, and, I believe, in every other language, there are many expressions like this; as, when we say, that 'Goodness is amiable,' 'Wisdom is profitable;' where it is plain that we use the abstract nouns, goodness and wisdom, for the substantive noun and the adjective: So that it is the same thing as if we praedicated the quality of *amiableness* of a good man, or of *being profitable* of a wise man.

And thus, I think, it most evidently appears, that all propositions of every kind are either praedications of the two kinds I have mentioned, or resolvable into these. Whoever desires to be further informed upon this subject, may consult Aristotle, in his *Last Analytics*, lib. 1. cap. 22. and his Commentator Philoponus, p. 52. who, I think, has explained the matter much better than Ammonius.

substance is that which exists by itself, and in which the accident is inherent.

As, therefore, the general idea of agreement or disagreement will not account for the truth of propositions, let us consider what particular *agreement* or *disagreement* arises from the two relations I have mentioned betwixt the praedicate and subject of a proposition; and this will be pretty obvious from what has been already said: For if, in the first kind of propositions, the praedicate has really the relation of genus to the subject, as a species under it, then is the proposition a true *affirmative* proposition.—Again, if the praedicate has really not that relation to the subject, then is the proposition, which denies that the subject is a species of the praedicate, a true *negative* proposition. And, in the other kind of propositions, if the praedicate has really the relation of *accident* to the *subject*, and is inherent in it, as accident is in substance; then is the proposition a true *affirmative* proposition.—Again, if the praedicate and subject have really not that relation to one another, then is the proposition, which denies the existence of that relation betwixt them, a true *negative* proposition. And thus we see that the particular *agreement* or *disagreement* of ideas, which make a true proposition, whether *affirmative* or *negative*, is their agreeing or disagreeing in the relation of genus and species, or of accident and substance.

To illustrate this by examples: When I praedicate *animal* of *man*, or, when I say, as we express it in English, that ‘*Man is an Animal*,’ it is a true *affirmative* proposition, because *animal* is really the genus of *man*.—Again, if I deny that *animal* can be praedicated of a *stone*, that is, if I say, that ‘*An animal is not a stone*,’ it is a true negative proposition, *animal* not being the genus of *stone*. And, with respect to the other kind of propositions, if I praedicate *white* of *man*, or, in other words, say, that ‘*Man is white*,’ the proposition is a true *af-*

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firmative proposition, because *white* is an accident really inherent in *man*, as a substance.—Again, if I say, that ‘A crow is not white,’ it is a true *negative* proposition; because I rightly deny that *white* is an *accident* inherent in a crow as a substance.

And thus, I think, that, by the assistance of antient philosophy, I have made some science, and something determinate, out of that general and most imperfect account given of Truth by Mr Locke.

CHAP.

C H A P. III.

The Necessity of understanding the Principles of Logic, in order to understand the Principles of Science and Demonstration—The greatest Genius, without teaching, not sufficient for that Purpose—Aristotle how taught—Case of the Philosophers before his Time who had not learned to analyse Reasoning—General Propositions, either Axioms, or Propositions to be demonstrated—Nature of the Evidence of Axioms may be explained—This is best done with respect to the Axioms of Geometry—Geometry the first Science among Men—and the Reasons why it was so—Instances from the Axioms of Euclid—Evidence of those Axioms the immediate Perception of a Contradiction, if they were not true—Consciousness the Foundation of the Perception of Truth—Therefore the Brutes have no such perception—Axioms and Demonstration in other Sciences as well as Mathematics—Instances of Axioms in Physics and Metaphysics—Instances of Axioms relating to the other Categories as well as to Quantity.

WHAT I have said in the preceding chapter concerning the connection of the praedicate or attribute with the subject, in propositions of which both the terms are general, is not to be understood by a reader who does not know the difference betwixt Sense and Intellect, Generals and Particulars, Genus and Species, Accident and Substance ; for, (I must repeat it again, tho' I should give offence,) let a man flatter himself as much as he will, and think as highly as he pleases of his genius and natural parts, I will use the freedom to tell him, that, without the knowledge of these first Principles of logic, he

never can understand, as a philosopher ought to understand, the philosophy of Mind, and the nature of Truth and Science. These principles are to be learned from Aristotle's book of Categories, with the assistance of Porphyry's Introduction to that book, and of Ammonius's Commentary upon both the Introduction and the Book itself. There are, I doubt not, some French or English systems of logic which may be of use to the reader; but with these I am not much acquainted, nor desire to be more, because I chuse to go to the source itself, being well assured, from what I know of them, that, if they have not drawn from that source, they have produced nothing that is valuable upon the subject. Not that I believe it to be absolutely impossible, even as men are educated and live at present, that our times should produce a great genius in philosophy; but I say, *that* genius must be taught, and by good masters; and, that it is impossible, without such assistance, for any mortal man to invent a whole system of science. I think I may say, without offence to any modern philosopher, that Aristotle had as acute and inventive a genius in philosophy as any of them; yet, I will venture to affirm, that, unless he had been taught, as he was, both by Socrates and Plato, and, unless he had studied diligently, as it appears he did, the writings of the more antient philosophers of the Ionic and Eleatic school, and of a greater school than either of these, I mean the Pythagorean, from which he took his book of Categories, the foundation of his whole system, he never could have discovered the Syllogism, (if it be true that it is his discovery), nor produced that compleat system of logic to be found in his book of Categories, his first and second Analytics, his Topics, and his treatise of Sophism, to which the labours of all the ages since his time have added nothing considerable. Before him, many philosophers, no doubt, reasoned very well, and made great discoveries; but they reasoned as the women and children spoke; for, though women and children, who have been well educated, may speak very well, they do it by mere habit,

bit, without being able to give any account *how* they do it; the reason of which is, that they cannot analyse language into its elements, nor account how these elements are composed into speech; for analysis is the work of art or science. In the same manner, the philosophers before Aristotle could reason very well; but, as they could not analyse reason, so they could not give any rational account why one argument was conclusive, and another inconclusive; but they knew them to be so only by *common sense*, that is, natural sense, not instructed by science.—But to return to our subject.

In all the propositions I now speak of, the mind perceives the connection betwixt the praedicate and the subject, either directly and immediately, or by a process of reasoning, that is, by the exercise of the *dialectic*, as it is called in Greek, the *discursus mentis*, as it is called in Latin, or *discourse of reason*, as it may be translated into English. Of the first kind are Axioms, or propositions of intuitive evidence. These, though they cannot, by their nature, be demonstrated, yet some account, I think, may be given of the nature of the evidence upon which we believe them to be true; for it will not satisfy a philosopher to say, that, by *instinct*, we believe them to be true; because *instinct* has nothing to do with intellect, or speculative truth of any kind, it serving only to direct practical life, as it does entirely among the brutes, and, in some instances, among us. It, therefore, relates only to appetites and inclinations prompting us to act, but has no concern with opinions or belief of any kind, and, consequently, not with *common sense*, which is nothing but *opinion* in the ordinary affairs of life, not formed by art or science, but arising from experience and common observation.

I will begin with the axioms of geometry, which, I am persuaded, was the first science, properly so called, among men. This I believe for two reasons; the first is, that the ideas of geometry are the simplest,
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the most determinate, and easiest abstracted of any of the ideas that we form of corporeal things ; for the ideas of figures, lines, and dimensions, are the superficial qualities of bodies, obvious both to sight and touch, and having nothing to do with the inward frame or texture of body, from which its other qualities result, and of which, as I have said more than once, we know nothing. 2^{do}, The mind, in operating upon lines and figures, has an assistance from the sense and imagination, which it cannot have in other abstract sciences. The assistance I mean is that of diagrams : But we ought to take care not to mistake those *symbols* of ideas, which would not be at all necessary if our intellect were more perfect, for the ideas themselves ; so as to imagine that geometry is conversant only with sensible objects. For these reasons, I believe that geometry was the first science among men, begun, as Aristotle informs us *, among the Egyptian priests, the first men, of whom we have any knowledge, that had leisure, and were dedicated to the study of religion and philosophy. For the same reasons, it is evident, that it is the most proper science for enabling the mind to disentangle itself from matter, and to begin its ascent towards the immaterial world, and the *invisible things of God* ; for which purpose, chiefly, as I have elsewhere observed †, the study of it was recommended by antient philosophy. It is also a science of the greatest certainty and accuracy ; not only because the ideas of it are so clear and determinate, but the subjects of it, lines and figures, have a fixed standard and measure of their own kind, by which they can be exactly compared together, and pronounced to be equal or unequal, or in such and such a ratio to one another ; whereas, the qualities of body, (I speak of *quality* as contradistinguished from *quantity*), such as hard or soft, sweet or bitter, hot or cold, cannot be so measured ;

and

* Metaph. lib. 1. cap. 1. in fine.

† See page 3. *et sequen.*

and therefore we say of them, as Aristotle has observed, not that they are equal or unequal, but more or less, like or unlike *.

The first geometrical axiom I shall mention is this, 'That the whole is greater than the part.' The meaning of which is, when it is analysed according to Aristotle's method, *that greater than the part* is an accident or quality of the idea of *whole*. Now, this is a self-evident proposition; because the connection betwixt the praedicate and subject is immediately seen, if we understand the meaning of the terms; for a whole being that which consists of parts, two or more, all which together are only equal to the whole, we immediately perceive that it would be a downright contradiction to suppose that one of these parts was equal to the whole.

Another of these axioms, and which is placed first in Euclid's order, is, 'That things which are equal to the same thing are equal to one

* See Aristotle's Categories, cap. 6. *in fine*. This Aristotle says of *quantity* in general; and it is as true of quantity *discrete*, or *number*, as it is of quantity *continuous*, such as *body*; and, for the same reason, namely, that number furnishes for itself a fixed standard or measure, by which its quantity is precisely ascertained; so that one number may be said to be exactly equal to another, or in a certain ratio to it. Among other discoveries of Nature we have made in modern times, by means of experiments, we have found out a way of measuring the degrees of heat and cold, by the ascent of fluids in a glass tube. But, in the first place, as we do not know the beginning of heat or cold, we cannot tell what ratio any degree of it has to the whole. But, 2dly, we are by no means sure that the degrees marked upon even a mercurial thermometer, are exactly equal to one another. We are very sure that the ascent of spirit of wine, in a thermometer, is very different, according to the different degrees of heat; and, though the difference is not near so great in a mercurial thermometer, there is good reason to think, or, rather, there is a certainty, that there is some difference. We cannot, therefore, precisely know even the excess of one degree of heat or cold above another.—See what I have further said concerning the difference of quality and quantity, in a note upon page 297.

‘one another *,’ where the accident or quality of being equal to one another, is praedicated of things equal to the same thing. As there is some dispute about this axiom, before I come to inquire concerning it, I must observe, that, though the greater part of Euclid’s axioms relate to equality, yet he has given us no precise definition of it; which, however, was the more necessary, that there is equality in *number*, as well as in *magnitude*, but very different one from another. It is true, there is one of the axioms which lays it down, ‘That things which are congruous, or fitting to one another †, are equal.’ But, supposing this to have been among the definitions, which it ought to have been, it is not sufficiently precise; for *congruous*, or *fitting*, are terms of too indefinite a meaning for a mathematical definition. The true definition, therefore, of equality of *magnitude*, with which only geometry is concerned, is that given by Appollonius ‡. ‘Magnitudes,’ says he, ‘are equal, which occupy the same space.’ And which definition Dr Simpson has very properly adopted.

This being premised, the evidence of this first axiom is easily explained; for, let us suppose that the magnitudes are not equal to one another, there would be a contradiction to the hypothesis, apparent

* I cannot help observing a little inaccuracy in the expression of this axiom, such as is hardly ever to be found in Euclid; not, as far as I know, in any other instance. It should have been expressed thus, ‘Things, which are *each* equal to the same, are equal to one another;’ for two or more things, taken together, (*not separately*,) may be equal to a third thing, and yet not equal to one another. I am the more surprised at this inadvertency, and in the first axiom too, that I observe that, in his propositions, where he compares two things to other things, in point of equality, he expresses, that it is each to each, *ἑκάτερον ἑκάτερον*. See the fourth proposition of the first book.

† The Greek is, *τὰ σφραμιζόμενα ἐπ’ ἀλλήλων, ἰσα ἀλλήλοις ἵστι*, which Dr. Simpson has thus translated, with more regard to the meaning than the words: ‘Magnitudes, which coincide with one another, that is, which exactly fill the same space, are equal to one another.’

‡ See Proclus, in his Commentary upon the first book of Euclid, page 70.

rent at first view, without inference or deduction ; for, if A were equal to C, and B equal to C, and yet A greater or less than B, then it would not occupy the same space which B occupies, viz. the place of C, which would be contrary to the hypothesis, laying it down, that A and B are equal to C ; that is, occupy the same space which C does. I therefore agree with Proclus in the passage above quoted, that this axiom is truly an axiom, or self-evident proposition, and that Apollonius was in the wrong to seek for a demonstration of it. And accordingly Proclus has shown, that the proposition, by which he proves it, is plainly a supposition of what is in question, or a *petitio principii*, namely, that two magnitudes, which possess the same place with a third, possess each the same place that the other does.

What I have said of this first axiom concerning equality, will, I hope, be sufficient to show that, not only the evidence of all the axioms relating to equality, but of all the other axioms of Euclid, arises from the inconsistency and contradiction to the hypothesis which the mind immediately perceives there would be in supposing the contrary ; for it would be, to suppose the same thing to be and not to be. If a sceptic is not satisfied with this, but inquires further, how the mind perceives the connection or contradiction betwixt the ideas in such propositions ? I answer that question by asking another, How does the mind know that it perceives the two ideas ? The answer must be, That it is by consciousness ; and I say it is by the same consciousness that we perceive the relation betwixt the two ideas, it being impossible that we should have the perception of the two ideas, and not, at the same time, perceive the relation betwixt them.

It is by consciousness, therefore, that we perceive truth ; for, without consciousness, we cannot know it to be truth. The brutes, therefore, wanting consciousness, have not, as Simplicius has obser-

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ved,

ved *, any perception of truth ; for, though they have true perceptions, and perceive also the relations betwixt those perceptions, yet they do not *perceive* that they *perceive*, and, consequently, have no perception of truth. The necessity of this reflex act of the mind is most apparent in syllogistical truth ; for, if a man is not conscious of the truth of the two premisses of a syllogism, and does not reflect, or, as it were, look back upon them, he cannot proceed to infer the conclusion.

Those, who have studied mathematics much, and no other science, are apt to grow so fond of them, as to believe that there is no certainty in any other science, or any other axioms except those of Euclid. But, if they were philosophers, and could see the whole extent of the objects of human knowledge, they would know, that science is not confined to one of the categories, viz. *quantity*, but that there are axioms and demonstrations belonging to every one of the categories, and some to all of them in general, particularly one mentioned by Aristotle †, viz. ‘ That it is impossible the same thing can be, and not ‘ be, at the same time, and in the same respect.’ This is the most universal of all the axioms, and the most certain, says Aristotle, of all the principles ‡. It is, indeed, the foundation of all truth, and all

* Ου ὡς ἀληθους ἀντιληπτὴ ἡ ἀλογος γινώσις, ἀλλὰ μοῖσι τοῦ πραγματος, ὅπου καὶ ἵστι γινώσκων ἀληθὺς μὲν ὑπαρχούσα, οὐκ αὐτὸ τούτο κρίνεται ὅτι ἀληθὺς. ἀπιστητικὴς γὰρ ἐστὶ ἐκείτη γινώσκω, τῆς ὅτι αὐτὸ τούτο γινώσκαι ὅλως ἢ ὅτι ἀληθὺς, ἢ ψευδὺς ἀντιληφομένης· αὐτὴ γὰρ αὐτῇ γινώσκται. *Simplicii Comment. ad lib. 3. Aristotelis de Anima, fol. 57.* And he adds, what is certainly true, that the brute is wholly conversant with external things, without attending to any thing that passes within himself ; and therefore he has no notion of truth in speculation. Neither in practice has he any knowledge of what is good or ill, (for that also is acquired by reflection alone), but only of what is pleasant and disagreeable.

† *Metaph. lib. 4. cap. 4.*

‡ βεβαιότατη αὐτὴ τῶν ἀρχῶν πάντων. *Ibid.*

all science ; for, if it were not true, we could affirm and deny the same thing at the same time, so that nothing would be either true or false. It is, as I have observed, by discovering this repugnancy and contradiction in the contrary of the geometrical axioms above mentioned, that we perceive their evidence. And, if it was by inference and deduction that we perceived this contradiction, I would say, as some have said, that they were demonstrable. But, as we perceive it intuitively, and by one single act of the intellect *, I think they are self-evident propositions of intuitive, not demonstrative truth.

There is another logical axiom, which belongs also to the whole categories, and which Aristotle has made the foundation of his doctrine of the syllogism, viz. ‘ What can be praedicated of any general, may ‘ be praedicated of every particular comprehended under that general ;’ or, as the schoolmen have expressed it, *Quod verum est de toto, verum est de omni.*

There is also a third axiom, which applies to all the categories, and is the foundation of all true physics and metaphysics, viz. ‘ That nothing can be produced without a cause ;’ or, in other words, ‘ That ‘ nothing can come out of nothing ;’ an axiom, of which the truth was admitted by all the philosophers of antiquity, by Epicurus as well as Plato, who have both made it the foundation of their cosmogeny †. And Aristotle tells us, that all the physiologists, with-

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* *Μᾶλλον ἐπιβολή*, as the Commentators upon Aristotle express it, whereas, in the process of reasoning, there are *πλεονεξίαι ἐπιβολαί*, more acts or exertions of the intellect upon the question proposed.

† See Plato in the *Timaeus*, p. 1046. edit. Ficini. *Πᾶν το γινόμενον ὑπ’ αἰτίου τινος ἐξ αἰτίας γίγνεται, παντί παρ’ αὐτοῦτος χωρίς αἰτίου γένεσιν ἔχει.* And Epicurus says, in Lucretius,

Principium hinc ejus nobis exordia sumet,
Nullam rem e nihilo gigni divinitus unquam. Lib. 1. in initio

out exception, of his time, and before his time, agreed in that principle*.

These are axioms belonging to all the categories in general; but there are others which belong to some of them in particular; such as concerning substance, that it must necessarily exist by itself, and is the ground-work or subject, in which all the other categories are inherent; so that it is an axiom relating to them, that they cannot exist by themselves. And, with respect to the category of relation in particular, it is an axiom of which I have had occasion to make use †, 'That it cannot subsist without two things, at least, existing at the same time.' And also, with respect to the category of suffering, it is an axiom, 'That, where there is a patient, there must be also an agent.' Many more axioms, relating to other things besides quantity, might be enumerated; but these are sufficient for the present purpose. And it is to be observed, that the evidence of them is the same as of the geometrical axioms, namely, that the supposition of the contrary implies a contradiction and impossibility, which the mind immediately perceives.

Thus, I have endeavoured to give some account of the truth of axioms, without pretending that they are capable of demonstration; for, if they could be demonstrated, they would not be axioms; and, if there were no axioms, and every thing was to be demonstrated, there could be no demonstration; for the same reason, that, if there were no categories, or general classes, to which things could be ultimately referred, there could not, as I have observed, be any definition ‡. And the reason is, that, in both cases, the thing would go on *in infinitum*.

Now,

* Aristotle, therefore, says, that it was *κοινὰ δὲ τὰς φύσεις*, which is pretty much the same name that Euclid gives to his axioms, viz. *κοινὰ ὅμοια*, that is, notions common to all men that have any use of reason.

† Book 2. chap. 3. p. 67.

‡ Book 3. chap. 1. p. 317.

Now, of infinity there is no science nor comprehension*. Our sceptics, therefore, when they demand a proof of axioms, instead of showing their genius or learning, show only their ignorance, according to Aristotle's judgment †.

CHAP.

* This is the reason that Aristotle gives why there cannot be a demonstration of every thing. 'Ολος μιν γὰρ ἀπάντων ἀδύνατον ἀποδείξαι εἶναι, οἷς ἀπίστον γὰρ αὖ βαδίζουσι ὥστε μὴδ' οὕτως εἶναι ἀποδείξαι. *Metaph. lib. 4. cap. 4. in initio.*

† Ἐστὶ γὰρ ἀπαιδευσία το μὴ γινώσκοντι τίνα δι ζήτην ἀποδείξαι, καὶ τίνα οὐ διζ. *For it is ignorance, and want of instruction, not to know of what to require demonstration, and of what not. Ibid.*

C H A P. IV.

When the Proposition is not self-evident, then there must be the Discursus Mentis in order to prove it—The Nature of this Discursus—All the Discursus, however various, reducible to the Syllogistical Form—Definition of Syllogism—Form of the Syllogism explained by Aristotle in his first Analytics—The Analysis there most wonderful—Syllogism may be perfect in its Form, and yet the Conclusion may be false, dubious, or certain, according to the Nature of the Premisses—What makes the Syllogism demonstrative explained by Aristotle in his last Analytics—The Method observed by Aristotle in that great Work—The Nature of Demonstration—Definition, as necessary for it as Axioms—Two Kinds of Demonstration—the one direct—the other indirect—or ex absurdo—The Difference betwixt Analysis and Demonstration—Analysis the Method of Discovery in all Sciences—Similitude betwixt the analytical Reasoning and the Demonstration ex absurdo—The Dialectical Method of Reasoning different from any yet mentioned—The Dialectic of Aristotle quite different from that of Plato—Aristotle's Dialectic much practised before his Time—but only reduced to an Art by him—Nature of this Kind of Reasoning illustrated by Examples.

IF the mind do not perceive intuitively the connection betwixt the praedicate and subject, as in the case of axioms, or self-evident propositions, it can do it no otherwise than by the intervention of other ideas, or by the use of middle terms, as they are called
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in the language of Aristotle. And this application of the middle term, first to one of the terms of the proposition, and then to the other, is performed by that exercise of the intellect, which is very properly called in Greek *διανοια*, because the intellect, in this operation, goes betwixt the two terms, as it were, and passes from the one to the other. In Latin, as there is not the same facility of composition, it is expressed by two words, *discursus mentis*, *mens* being the same thing in Latin, as *Νους* in Greek; and the Latin expression is rendered into English by *discourse of reason*, or, as it is commonly called, *reasoning*.

When the *discursus* is performed, and the argumentation completed, it is called by Aristotle a *sylogism*; which, according to the etymology of the word, imports that it is a collection: And undoubtedly the conclusion is a collection from the premises; and accordingly it is defined by Aristotle to be ‘*Speech, in which certain things being laid down, another thing, different from these, does, by necessary consequence, follow from what is so laid down* *.’

This necessity of the conclusion is in every syllogism, if it be truly a syllogism; that is, if the syllogistical form be observed; and the form is so universal, that it applies to all kinds of reasoning; so that every argument is a syllogism, tho’ all the propositions may not be expressed, but one of them implied or understood; which kind of incomplete syllogism is called an *Enthymema*, importing that one of the propositions is in the mind of the speaker or writer. All ratiocination, therefore, however various or complex it may seem, if the conclusion be rightly inferred, is resolvable into the syllogism; and, if the conclusion be not
rightly

* Συλλογισμός δι ἐστὶ λόγος, ἐν ᾧ τίθενται τινες, ἴτερον τι τῶν κειμένων, ἐκ ἀνάγκης συμβαίνει, τῷ ταῦτα εἶναι— which he thus accurately explains, Λέγω δὲ, τῷ ταῦτα εἶναι, το διὰ ταῦτα συμβαίνειν, το μηδὲν ἔχον προεῖν πρὸς το γίνεσθαι το ἀναγκαῖον. *Analytica Priora, lib. 1. cap. 1.*

rightly inferred, then there is a defect in the form of the syllogism; and it is what Aristotle calls *unsyllogistical*.

But, what is this form of the syllogism, of such universal use, and the touch-stone, as it seems, of all kind of reasoning? This question is answered by Aristotle, in his *First Analytics*, which are so called, because they *analyse* human reason into its elemental parts, showing, at the same time, how those parts are to be put up again, as it were, and combined, so as to produce certain conclusions; the work therefore is *synthetical* as well as *analytical*, though it be denominated from that part of it which must necessarily precede the other, and may, therefore, be considered as principal. The book of Categories, and that of Interpretation, the one treating of simple terms, the other of the composition of these into propositions, are only preliminaries to this *magnum opus*; yet are they, considered by themselves, works of great science, and particularly the last, which contains speculations exceedingly subtle and intricate. And the whole, taken together, is so wonderful a system of science, that, if Aristotle be truly the author of it, it is the greatest discovery in science that ever was made by a single man, since the beginning of the world. But I have some reasons, which I shall give in a more proper place, for thinking that Aristotle took the doctrine of the syllogism from the Pythagorean School, as well as the doctrine of Categories*.

But, though the syllogism be perfect as to its form, the conclusion may not be true; for, if either of the premisses be false, probable, or doubtful, the conclusion will be of the same kind; whereas, if the premisses be necessarily true, the conclusion will likewise be so. And this

* See, upon this subject, the last book of this volume, where I give an account of Aristotle's philosophy, and where there is a great deal more said concerning the syllogism.

this is what is called *demonstration*. And a syllogism of this kind is a demonstrative syllogism ; the nature of which, as distinguished from other syllogisms, is explained by Aristotle in his last Analytics, or *Posteriora*, as they are commonly called by the Latin interpreters.

And here the reader may observe the general method of this great work of Analysis ; the design of which, as Aristotle tells us in the beginning of it, was to show what science or demonstration is ; a question very much agitated in the *Theaetetus* of Plato, but nothing determined. And I have little doubt but that Aristotle desired to have the glory of answering a question which his master had only puzzled and perplexed. Now, analysis is the method of invention in every science ; for, in discovering any science, we begin with the compound, and resolve it into its elements or first principles ; but, according to the method of teaching, where the analysis ends, there the teaching begins. Thus, whoever first made a science of language, must have begun with the compound *speech*, which he would continue to analyse or unravel, till he came to its ultimate elements, viz. the elemental or uncompounded sounds ; and, where the analysis ends, the grammatical art, as it is taught, begins *.

In the same manner, Aristotle, proposing to explain the demonstrative syllogism, analyses it first into the syllogism of which
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* It is the same in *practice* as in *theory*. When any thing is proposed to be done, the mind begins with the contemplation of that thing ; and then it considers all the particulars which are necessary for the doing it. And in doing this, it goes back in order, till it comes to what is first to be done. Thus, if a man proposes to build a house, the completion of which is the putting on the roof, by which it is to answer the chief purpose of a house ; the beginning of the theory is the roof or covering ; but, in order to support a roof, there must be walls ; and, in order to have walls, a foundation must be dug. And here, where the theory ends, the practice begins.

it is a species ; then the fyllogism into propositions ; and, lastly, propositions into simple terms, which are the elements of this science. Beginning, therefore, with *terms*, without which propositions are not to be understood, he proceeds to propositions ; from propositions he goes to fyllogism ; and from fyllogism in general, he proceeds to the demonstrative fyllogism ; which, without the knowledge of what fyllogism in general is, cannot be understood.

Thus much, I hope, will be sufficient to show the method that Aristotle has followed in this great work, and that this, and no other method, was proper to make a science of it. But, as to particulars, it would not be proper that I should enter into them, as I do not write a logical, but a metaphysical work. I will, therefore, only add as much as will be necessary to show the nature of *demonstration*, or scientific truth, and of other evidence of an inferior kind.

And, *first*, as to demonstration, it is not only necessary that the terms of the proposition, to be connected in this way, should be ideas or generals, but also, that the middle term, connecting them, should be of that kind : And that middle term either should be an axiom, or it should be connected with each of the two terms, by some axiom, or, which is the same thing, by some proposition before demonstrated.

But, before the two terms of the proposition to be demonstrated can be thus connected, we must know perfectly the nature of the two terms, that is, the praedicate and subject, as well as of the term by which they are to be connected ; for, otherways, it will be impossible to know that they are necessarily connected. Now, it is by definition that the nature and essence of any thing is made known ; and hence it appears, that definition, as well as axioms, is absolutely necessary for

for demonstration. And, accordingly, all Euclid's demonstrations result from definitions and axioms, which, therefore, are very properly prefixed to his work.

And thus it appears that all demonstration, or science properly so called, is derived from the knowledge of the nature and essence of the subjects of the demonstration, and from self-evident propositions.

Demonstration is of two kinds ; it is either what is called *direct*—or it is what Aristotle calls *apagogical*, that is, *ex absurdo*, as our mathematicians express it. The former is, when we demonstrate from the nature of the thing as comprehended in its definition. The other is, when we demonstrate the impossibility of the contrary, by showing the absurd consequences that would follow upon the supposition of the contrary. This method of demonstration must appear, at first sight, to be a round-about way of coming to the truth, and, therefore, it is very properly opposed to the direct method. It is, however, as convincing, and proves equally that the thing is ; but it does not show us *why* it is, which the other does, being deduced from the nature of the thing ; and, therefore, the other is very properly judged by Aristotle to be preferable, and more scientific.

Not only is the analytic method used in whole systems of science, such as the philosophy of the human mind, but in the investigation of particular propositions, whether theorems or problems ; and the method is the same in both, namely, to begin where the teaching ends, that is, to suppose the theorem to be already demonstrated, or the problem performed, and then consider what the consequences will be ; and, if we find that these consequences do lead us, by one or more steps, to some axiomatical truth or proposition before demonstrated, with which the theorem or problem is necessarily connected, there is an end of the analysis, and there the teaching begins ; for, by descending from this principle, to

which we have thus ascended, we demonstrate the proposition to be true.

In this way, every proposition of Euclid may be analysed ; and as, in this way, every system of science has been discovered, so I have little doubt but that the greater part of the particular propositions of Euclid have been investigated and discovered in the same way ; for men would naturally suspect the proposition to be true, before they could demonstrate it ; and this would lead them to consider what the consequences would be, upon the supposition that it was true. And, accordingly, we know very well that the antients practised this method very much in geometry, and, I believe, likewise, in other sciences.

It very much resembles the demonstration *ex absurdo*. And it is truly of the same kind in this respect, that they are both from consequences ; for the one shows that, if the contrary of the proposition be supposed true, the consequences would be absurd and impossible ; while the other shows, that, if the proposition be supposed to be true, it is necessarily connected with some known truth. They both, therefore, argue from the effect to the cause, and therefore are said to be *a posteriori* ; whereas, direct demonstration argues from the cause to the effect, and therefore is said to be *a priori* ; and, where it can be had, is, for these reasons, more satisfying to the mind, and more philosophical.

It is in this way that Porphyry the philosopher, as quoted by Proclus *, has explained the different methods of scientific reasoning.—All such reasonings, says he, is either *from* the principles, or *to* the principles ;

* Proclus's Commentary upon the first book of Euclid's Elements, lib. 3. p. 69.

ciples; and each of these is twofold. The former is either *from* principles self-evident, or from propositions already demonstrated. Again, the reasoning *to* the principles does either establish those principles, or overturn them. If it establish them, it is analysis, which I have already explained; and it is opposed to *synthesis*, by which we descend from the principles which we have discovered by the *analysis*, and, in that way, demonstrate *a priori*. If, on the other hand, it overturn the principles, then it is what is called *apagogical* reasoning, or a reduction to what is absurd or impossible. This happens, when we suppose, as I have said, the contrary of what is proposed to be proved, and show that such a supposition is necessarily connected with something that is absurd or impossible.

This is the nature of demonstrative and scientific reasoning. But there is another kind of reasoning, which was much practised, even by philosophers in antient times, and was always, and is still the chief kind of reasoning used by rhetoricians and public speakers, being almost the only kind of reasoning that can be understood by the *people*, that is, by men who are not taught or instructed. It was called *dialectic* by Aristotle; but it is to be observed, that his *dialectic* is very different from the *dialectic* of his master Plato, which was entirely of the *metaphysical* kind, being deduced from the highest and most universal principles. Plato, at the same time, knew very well the *dialectic* of Aristotle, and has practised it very much; nor was there any kind of reasoning more in fashion at that time, being used, not only by the orators, but by the sophists, who, not having science, and, consequently, not being able to argue from the nature of the thing, argued *dialectically*. But it was not reduced to an art, till Aristotle, to whom arts, as well as philosophy, have been so much obliged, composed his books of *topics*.

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It does not argue, as I have said, from the nature of the thing, nor from axioms belonging to particular sciences. It has, therefore, nothing to do with definition, nor with principles of science. From this account of it, the reader will be apt to imagine that it is merely an art of sophistry, teaching men to argue and dispute without any science, and upon subjects which they do not understand. But, though it was very much used, and abused too, by the sophists of old, yet, as Aristotle has taught it, it is not an art of sophistry or deceit, which to have taught, would have been most unworthy of a philosopher; but it is an art that has its principles from which it fairly draws its conclusions.

These principles are either assumed by the speaker, as probable truths generally believed; or they are granted by those to whom he speaks; and, from these principles, he argues by the means of the general propositions, called, by Aristotle, *topics*, being the place or seat of arguments, *sedes argumentorum*, as Cicero has explained the word*.

The thing will be best illustrated by two or three examples. Suppose the question to be proved is, 'that temperance is good or beneficial.' To prove this from the nature of virtue, would be to argue from the principles of a particular science, viz. *morals*, and is not an argument of the kind of which I speak. But, in order to prove the point *dialectically*, I assume, either from common opinion, or the concession of my adversary, that 'intemperance is evil or prejudicial.' And then I argue thus: If intemperance is an evil, temperance, which is the contrary, is good. And the topic, or general proposition, in which this argument is included, is, that, 'When two things are opposite, whatever follows from the one, the contrary thereof will follow from the other †.'

Again,

* Cicero's Topics, *in initio*.

† Aristotle's Topics, lib. 2. cap. 8.—Rhetoric, lib. 2. cap. 3. *in initio*.

Again, if it be proposed to prove that a thing is evil, I assume this proposition, that the thing destructive of it is good; and then I argue from this topic, that, 'Of any thing the destruction being good, the thing itself must be evil.'

Another very common topic, much insisted on by the rhetoricians of those times, and, I believe, of all times, is, that, 'Whoever does what is more, whether good or ill, must be presumed to do what is less.' The topic which includes this argument is, that, 'Where the greater is, the lesser will also be*.' And another more common topic still, in all popular assemblies, is, that, 'Whoever falls into contradictions or absurdities in arguing a cause, has a bad cause.' Nor is there any argument more prevalent among the people, though it be of no weight among philosophers, and men of science, who will consider the cause independent of the abilities of the speaker.

Another topic, which is not conclusive, but from which specious arguments may be drawn, is that by which I prove that it is not good to be wise or learned, because such are envied, and to be envied is an ill thing. The topic there is, that, 'Whatever thing ill follows from, that thing is not good;' or, to express it more generally or topically, 'Every thing is of the nature of that which follows from it.' And this, Aristotle tells us, was the whole art of Calippus, a rhetorician or sophist of his time. This argument, if both good and ill follow from the thing, may be turned different ways, as in the instance before us, where many good things may be mentioned, as the consequences of being wise and learned: And, to show the amphibology of this argument, Aristotle quotes a famous saying of a priestess, who dissuaded her son from haranguing in public assemblies of the people.

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* *Aristot. Rhetor. ibid.* This is called the *το μᾶλλον καὶ ὅττον*, and is a fruitful topic, as may be seen from Aristotle's books of Topics.

'If,' says she, 'you counsel what is just, men will hate you ; if what is unjust, the Gods.' For the argument may be turned contrarywise, in this manner: 'If you counsel what is unjust, men will love you ; if what is just, the Gods ;' And the conclusion will be quite opposite, namely, that you ought to be a public speaker. And thus, Aristotle takes care to inform us, when the topic is inconclusive, or when it is ambiguous, and proving either way.

From these instances, it is hoped the nature of this kind of dialectical or topical argumentation, will be sufficiently evident. First, I must know of the thing in question certain qualities or properties ; for, as Aristotle observes, if I know nothing at all of the subject, I can form no argument concerning it. Assuming, therefore, some particular proposition concerning it, either from common belief, or the concession of my adversary, I try whether from thence I cannot draw some conclusion by the means of some general proposition or topic tending to establish what I would be at. These general propositions may be called the *axioms* of this art ; and they so far resemble the axioms of geometry, that, as these are applicable to all kinds of lines and figures, and many of them to every subject of quantity, so the topics may be applied to every subject of disputation, of whatever kind.

Another thing is also evident from what has been said,—That this art is of universal use, not only in public speaking, but in our private intercourse with men ; for it is the only way we can argue with them upon the subject of any art or science which they have not learned. But, it is to be observed, that, though the study of Aristotle's art will, no doubt, furnish a great number of topics, yet, the ready use of them will chiefly depend upon our natural sagacity in perceiving what is consequent, or what follows from what, and what is contradictory or repugnant. With a great deal of this natural sagacity, men who

who have learned no art or science, no logic, dialectic, or rhetoric, will confound speakers who appear very eloquent and plausible. This is the case of the Indians of North America, as I was assured by a missionary who had been long among them *; and the same thing has been confirmed to me by others: For, both in their private conversations, when we can make them take the trouble to reason, and in their conferences and debates with us on public business, they show a wonderful power of dialectical reasoning. Without laying down any principles upon their side, they do no more than lay hold of what we have said, and show either that what we would deduce from it is not consequent, or that we are repugnant and contradictory to ourselves.—Their natural parts, I am persuaded, as I have said elsewhere †, are superior to ours; and therefore it behoves us the more to take all the assistance we can from learning. Now, I am convinced that the diligent study of Aristotle's topics, together with his books of rhetoric, in which a great deal of argument of the same kind is to be found, would give our orators a copiousness of argument, which they can never otherwise acquire. Nor are Aristotle's books of topics difficult to be understood; for they are of a popular kind, like his poetry and rhetoric, and therefore are written in a style not so concise and obscure as his books of deep philosophy: And, if any assistance were necessary for the understanding them, we have a very accurate commentary upon them by Alexander Aphrodisiensis, Aristotle's oldest commentator of the Alexandrian School.

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* Monsieur Roubaud. See what I have said of this missionary in the first volume of the Origin and Progress of Language, 2d edit. book 3. chap. 10. page 558.

† Origin and Progress of Language, vol. 3. *in fine*.

C H A P. V.

Of Propositions, whose Subject is an Individual Thing—Individual Things either Material or Immaterial—Of Propositions, whose Subject is a Corporeal Thing—Of these there can be no Science—Nature of our Knowledge of Corporeal Things—Use of that Knowledge.

THUS, I have finished what I have to say upon what may be called *ideal* propositions, that is, propositions of which both the terms are ideas, and have shown what the nature of truth is, both self-evident and syllogistical, in such propositions. I now proceed to the propositions of the other kind, concerning particular or individual things, of which only the greater term or praedicate is an idea; for that I have shown to be necessary in all propositions.

All particular things are either material or immaterial, that is, either body or mind; and I will begin with propositions of which the subject is corporeal. Now, of such subjects, it is impossible there can be any science or demonstration, for the following reasons.

First, These subjects are, as I have shown, in a continual flux, and perpetually changing their state; so that what is affirmed or denied of them, may cease to be true, before the enunciation is made. Now, as science is something fixed and permanent, and the truths of
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it eternal, the subject of it must, in like manner, be stable and permanent, without change or variation.

Secondly, We know nothing, as I have more than once said, of the nature and essence of body : We only know some qualities or properties of it ; and these, when attentively examined by the philosopher, are no other than the perceptions of our mind, produced by the impression made by body upon our organs of sense ; or, as Mr Hobbes has expressed it, *a tumult of the mind, excited by external things pressing upon the organs of sense* * ; which would be a good enough definition of sensation, if it did not confound that tumult which the sensation of pain or pleasure excites in the mind, with the simple perception of the object. In short, all sensation is nothing but the motion of external things, affecting, in different ways, our minds. And, that these affections of our minds must be very various and different, at different times, is evident, from this consideration, that our sensations must necessarily depend upon three things, *first*, the nature and disposition of the external object which produces them ; *secondly*, the habit or disposition of the organ upon which the impression is made, that is communicated to the mind ; and, *thirdly*, where the object operates upon the organ, not immediately, but through a medium, as in the case of seeing, hearing, and smelling, the sensation must depend upon the constitution of that medium.

Thus, it appears, that, in the perceptions themselves, so various and mutable, and depending upon so many accidents, it is impossible there can be any science. And the only science that can be in the matter

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* *Suscitatus a rebus externis organa prementibus, animi tumultus.* See the passage quoted at length, book 2. cap. 10. p. 143. from whence it appears, that Mr Hobbes falls into a much more dangerous error, when he confounds this tumult with science and intellect.

is concerning the nature and constitution of the external object, the organs of our senses, and the medium through which the object operates upon the organ. But, as all these are body, and as we know nothing of the nature or essence of body, it is impossible we can demonstrate any thing concerning them, though we are assured that every thing concerning them is governed by fixed and invariable laws *.

From the reason here given, why nothing material can be the subject of demonstration, it is evident, on the other hand, why ideas are the proper subject of science; for, as ideas are the creatures of the mind, we know perfectly their nature and essence, and therefore can compare them so, as to perceive their connection, either intuitively, or by the intervention of other ideas: Whereas, body, being the workmanship of God, we cannot penetrate into its essence.

But, do our senses give us no information? and, do we know nothing at all of sensible objects? My answer is, that our senses give us so much information, and so valuable, that, without such information, we could not exist in this world. And, besides, they furnish to us the materials, out of which intellect forms its objects: And it is by means of the senses that we discover the *species* which informs all material things, which alone is fixed and permanent, and which, therefore, is the only object of science.

But still it will be asked, Do we know nothing at all of the *matter* itself? Can we apprehend nothing of the river as it passes, to use the

* This is the reason (says Philoponus, in his commentary upon the first book of Aristotle's first Analytics, page 18.) why Aristotle, in enumerating the several species of propositions, of which the syllogism is composed, has omitted to mention propositions concerning individuals, or of which individuals are the subject; for, says Philoponus, such propositions are entirely useless in matters of science.

the allusion of Heraclitus*? Cannot we be at least assured that there is a river; that something truly exists without us; and that all is not dream and delusion?

The answer to this question will be the subject of the next chapter.

C H A P.

* See page 325.

C H A P. VI.

The Doubt about the Existence of the Material World not so old as Plato and Aristotle—First started, in Modern Times, by Dr Berkeley—Two Answers given to it, but neither of them satisfactory—Other Proofs, therefore, necessary—Previous Observations concerning Mr Hume's System of Philosophy on this Subject—Proof of the Existence of External Objects from a Principle acknowledged by the Sceptics, viz. Consciousness—Proof from the Case of Blind and Deaf Men—Proof from the Mind Being passive in the Perceptions of Sense—Objection answered—Mr Locke's Distinction of Primary and Secondary Qualities defended—Objection from our Dreams answered—The Mind then has not the entire Use of its Faculties—Therefore not able to distinguish betwixt Illusion and Reality.

THE doubt concerning the existence of the material world was first started in modern times by Dr Berkeley, and greedily caught at by the author of the Treatise upon Human Nature, and of the Essays, as very favourable to his design of overturning all science and certainty, and evidence of every kind. In antient times, it was first advanced by Pyrrho, who, finding no other way to distinguish himself, and to get a name among the great philosophers that had gone before him, did, as I believe, out of mere vanity, (the prevailing passion of sceptics in all ages, whatever their pretensions to modesty may be,) first broach this extravagant paradox, which, however, if it were true, would not answer Mr Hume's purpose, of putting an end to all science and

and certainty; for, though there were no material geometrical figures extant in the universe, as indeed there is none that answers to the definition of them, every demonstration in Euclid would be equally true, though geometry would not be, as I shall afterwards show, that *real* science, which it truly is. But, if there be no ideas neither, as Mr Hume maintains, there can be no science nor knowledge of any kind.

It appears, therefore, that this controversy about the existence of *body* was, like the controversy above mentioned, concerning *free-will*, unknown in the better days of philosophy, that is, in the days of Plato or Aristotle, or even before their time, but only in later times, when philosophy became frivolous and paradoxical, and, at the same time, not accurate in making proper distinctions of things; for, if Pyrrho had accurately distinguished, in the matter of sensation, as Plato does in the *Cratylus*, betwixt the object, the organ, and the perception of the mind, I think it is impossible that he could have thought of advancing such a doctrine, which plainly confounds the object with the perception, making sensation to be only perception, and so nothing more but a phantasm or spectre of the mind.

Mr Locke has been blamed for giving occasion to this error, by making the distinction betwixt the primary and secondary qualities of bodies, maintaining, that the former had a real existence in the bodies, while the latter existed only in our Minds. That Mr Locke did not mean to give a handle to such an extravagant scepticism, any more than to several other absurd, as well as impious notions, that have been grafted upon his philosophy, I hold to be certain. Nor do I think that he was much mistaken, as I shall show afterwards, in making the distinction, that he has made, betwixt the *primary* qualities of body, such as extension and solidity, and those he calls *secondary*, such as hot and cold, sweet and bitter. But he was certainly to blame, for not making more explicitly the distinction with respect to those last sensations,

tions, which he makes with respect to the former, viz. betwixt the sensation itself, and the external object which produces it.

There have been two answers given to Dr Berkeley and Mr Hume, but neither of which, I must own, satisfies me. The first is of the declamatory kind, setting forth, with a great deal of wit and ridicule, the absurdity of such an opinion, showing, at the same time, that it leads to universal scepticism, and a disbelief of the most important truths of religion and morality; asserting likewise, what I am persuaded is true, that no man ever sincerely believed that *matter* does not exist. But a philosopher is not convinced by declamation: Nor is ridicule a philosophical argument, whatever influence it may have upon the people; and it no doubt has a great deal. Neither is an opinion necessarily false, because it leads to dangerous consequences. And there may be many things true which are believed by nobody.

The other answer is more philosophical; but neither is it satisfying to me at least. It asserts, that the perception of every sensible object is necessarily accompanied with a belief of its existence; that this is the constitution of our nature, and that we are to inquire no more about it. But this belief is a matter of fact, which cannot be easily granted without proof. And, that it is constant and universal, I do absolutely deny. And I aver, that by far the greater part of mankind act according to the appearances the sense presents to them, without considering whether these appearances are from without or from within; or, in other words, whether the objects have any real existence. In short, they have no opinion upon the subject, any more than the brute-animals have, who act in consequence of these sensations, as well as we do. And, as to the thinking few, who have formed opinions upon this and many other subjects, that the vulgar never think of, if they say that they believe that the objects of sense are real existences, they must give some reason for their belief; for I have no
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conception of what is called a natural or instinctive belief; instinct, in the way I have explained it*, and as I believe the word is generally understood, is a principle of action, directing all the appetites and inclinations of the brute-animals, and many of ours: But it has nothing to do with opinion or belief; and, accordingly, the brute-animals have neither: It is only the intelligent animal who forms opinions, and believes. Now, it is impossible that intellect can believe any thing without a reason. And of this no man can have the least doubt, who has learned his logic, and who knows how ideas are formed, and how they are put together in propositions, in which the mind either gives a direct and immediate assent, upon the grounds I have mentioned, or is convinced of the truth of them by ratiocination.

All, therefore, that can be made of this argument, in favour of the existence of *matter*, is, that none of the vulgar have any doubt of it. But this general belief will not satisfy the philosopher, who will say, that, in our dreams, we see and hear most distinctly, and have other very strong impressions of the objects of sense. These objects, however, have no real existence, or, at least, do not operate upon our senses; and yet, while our dreams continue, we have no more doubt of the existence of them, than we have of the existence of the like objects when we are awake; and, even when we are awake, we have conceptions of objects which we are sure do not exist, such as the images we conceive of mountains of gold, Hippocentaurs, Gorgons, Chimaeras, and the like. Now, the defenders of this sceptical philosophy will say, Why may not our perceptions of sense be such as our dreams, and very often our waking thoughts are—mere fancies and creatures of the mind, without any real objects? Nor, indeed, have I yet heard any good answer to this argument; for, that

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* See, above, pages 138. 221.

we have a *phantasia*, in which things, that have no real existence, are pictured in the most lively manner, and have not only shape and colour, but voice and action given to them, is a fact that cannot be denied.

Thus, it appears, that the arguments hitherto used to prove the existence of a material world are not satisfactory; and the reason may be, what is somewhere observed by Aristotle, that the nearer any thing is to a first principle, and a self-evident truth, the more difficult it is to be proved, though it be that which every body believes. But, as it is the business of metaphysics to explain the first principles of science, so it belongs also to it to prove the truth of the most immediate deductions from those principles, especially if they be controverted.

But, before I begin this proof, I cannot help observing, that it is most extraordinary that Mr Hume, who denies the existence of the human mind, or of any mind in the universe, should deny, at the same time, the existence of *matter*; for, if he had admitted the existence of *mind*, it might have appeared possible that our minds should have produced all those illusions that we call objects of sense, and believe to be real, in the same manner as it actually does produce them in our sleep; and it might have been said, with some colour of reason, that our whole life was but a dream. But how such illusions should be produced, without either *matter* or *mind*, is to me altogether inconceivable: Nor, do I think, can it be believed by any man, who does not, at the same time, believe that any thing may be produced without a cause. There were, no doubt, antient philosophers, as well as there are modern, who denied the existence of *mind*, and therefore were called *materialists*. There have been others who, admitting the existence of *mind*, denied the existence of *matter*. Such was Dr Berkeley. Nor does it appear that Pyrrho, however sceptical he was in other things, ever called in question the existence of his own mind,

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or even of a mind in the universe; for I do not remember that ever he was branded with the name of Atheist. The glory, therefore, appears to be reserved for Mr Hume, to dispute the existence of both *mind* and *body*, and to differ in this respect, not only from the vulgar, but from all the philosophers that had been before him. But I do not think that he has shown abilities or learning sufficient to support his pretensions to so much superior wisdom. Thus much, at least, might have been expected of him, that he should have said something to reconcile the two opinions, the one with the other, and to convince us how things could go on in the world as they do, supposing all to be a dream, without either *mind* or *body*; for all the philosophers before his time, who were Atheists, were; at the same time, Materialists, and endeavoured to account for every thing in nature, and all the operations of men, our waking thoughts as well as our dreams, from mere matter and motion. Whereas Mr Hume, taking away matter, and, by consequence, motion, denying the existence of mind also, has left nothing in the universe, besides his own perceptions, which are produced by no cause that he assigns, and are an accident without a substance. What a strange face of nature is this! and what an extraordinary philosophy must this appear to any man who has but learned the elements of logic!

A man who maintains opinions so very singular, and which lead to such extraordinary consequences, should be able to bring the clearest proof of them; such as, that it is impossible, or implies a contradiction, that the contrary opinion should be true: And particularly, with regard to this question concerning the existence of matter, he should be able to show, that the idea of a substance having solidity, impenetrability, resistance, extension also, and figure, implies a contradiction. But this he has not so much as attempted to prove; and therefore it must be supposed that it is at least possible that *body* may exist; from which a philosophy altogether different from Mr Hume's would infer, that it does actually exist.

But it would be vain to use such an argument against Mr Hume, because it supposes a first cause, in the mind of which the idea of every thing possible exists, and, for that reason, is *actually* produced, as we cannot conceive any idea in the mind of such a being that is not brought into *energy* and *actuality*; for otherwise it would be there in *vain*. But this is a philosophy altogether out of sight of such philosophers: We must, therefore, in arguing with them, endeavour to prove, in some other way, that there is something material existing, which produces our sensations.

But what sort of proof are we to use against men who deny that there is such a thing as truth, or even that there is one thing more probable than another? But, I think, I can convince others, if not them, from a principle which they themselves have unwarily admitted, namely, the principle of *consciousness*, by which they say they are convinced that they have perceptions; for, if Mr Hume had carried his scepticism so far, as to dispute that he had even perceptions, it would have been impossible to have proved, at least upon his principles, that there was such a thing as *body*. But he admits that he is a *bundle of perceptions*. And the argument from those perceptions against him, for the existence of *matter*, is so much the fairer, that, from those very perceptions, he argues against the existence of matter; for, says he, we know nothing of material objects, but by our ideas of them. Now, our ideas are not solid, extended, or figured; therefore it is impossible that we can know that there are any such substances. And he adds, that our own philosophy, meaning Mr Locke's, admits, that our perceptions of the secondary qualities of external objects, such as white and black, bitter and sweet, have no existence in the objects themselves. And, for the same reason, what we call primary qualities, such as extension and solidity, have likewise no existence in the objects.

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My only postulatam, therefore, in this case, is such, that the greatest sceptic must grant it, namely, 'That the evidence of consciousness is infallible.' It is upon this evidence that Des Cartes was convinced of his own existence; '*For,*' says he, '*I think; therefore I am.*' Now, *that he thought*, he could not know otherwise than by consciousness. And one should have imagined the same argument might have convinced Mr Hume of his existence, though it seems it did not; for I do not think so meanly of this argument as some do: But, on the contrary, I am persuaded that we cannot be sure of the *existence* of any thing but from its *operations*. And the only difference in this matter, betwixt our own existence and that of other things, is, that we know our own operations by consciousness: Whereas, the operations of other things, we know only by the information of our senses. And he is so far, likewise, in the right, that he lays the foundation of his philosophy upon this clearest of all evidence, being that without which there would be no demonstration or proof of any kind: For, if we were not conscious of having perceived the truth of the premises, we never could infer the conclusion.—But, to proceed in our argument.

It is then admitted, that, by consciousness, we know that we have perceptions of sense: By the same means we know the difference of those perceptions; that the perception of *seeing*, for example, is not the same with the perception of *hearing*. And, further, we know, in the same way, the difference of the same perception in different circumstances. I see, for example, a *fire* at some distance. This I call the perception of the sense: I shut my eyes, and I still have the perception of fire; but it is a perception, I say, not from the sense, but from the phantasia. And the difference betwixt the two, I know, is, that the one is from within, and the other from without. That the one is from within, I know with the same certainty that I know I have the perception, and, by the same means, by consciousness.

ness. And, in the same manner, I know that, when I open my eyes, I have a different perception ; and my reason tells me that the difference must arise from something that comes in at my eyes, which I have opened, and, thro' that channel, affects my mind. It is in this way that, when I am in a dark place, and open a hole, I have, thro' it, the perception of light that I had not before. If it were possible to doubt that the perception of the fire, when the eyes are open, was from without, a man might soon convince himself, by going near, and putting his hand into it ; for then he would feel most sensibly the difference betwixt the image of the fire which he had before from within, by the means of the phantasia, and the perception he now has of it from without : So that, if our feeling, as well as our other perceptions, be real, as Mr Hume acknowledges, it must be admitted that there is a perception of fire, and, for the same reason, of other objects of sense from without. And, indeed, if all were from within, and that we might have perceptions without those five inlets to the mind we call *senses*, then a man, who, from his birth, was deprived of all his senses, might nevertheless have all the perceptions we have, and, for any thing I know, many more : Whereas, the fact is, that a man, deprived from his birth of one of these senses, such as seeing or hearing, has not the least perception or notion of the objects of that sense : Nor can a man of the liveliest imagination have the least perception of any corporeal thing, but what resembles the perceptions of some one or other of the senses : So that the *phantasia*, tho' a faculty of wonderful power, which performs such extraordinary things, both when we are asleep and awake, supplying, in some measure, the use of our senses, is nevertheless confined in all its operations to objects such as we have perceived by the senses. And all the fairy scenes that it represents to us are nothing but so many images of the material world, very often, indeed, strangely and wildly put together.

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Moreover, it is to be considered, that the appearances in the *phantasia* are, for the greater part, voluntary; for we can, by an act of our *will*, call up any image in the *phantasia* that we please; but, as to the perceptions of sense, they do not depend upon our will.

These arguments are, I think, sufficient to convince even such as are not philosophers, of the existence of things without us. But, with respect to the philosopher, who knows the nature of sensation, and how it is produced, one single argument is demonstrative; for, in the perceptions of sense, every man is conscious that he is passive, and that he is moved or excited to sensation by something. Now, wherever there is a *patient*, there must of necessity be an *agent*. And, wherever any thing is *moved*, there must of necessity, as I have elsewhere demonstrated *, be something that *moves*. As, therefore, the organ of sense is moved, and sometimes in the most sensible manner—and, as nothing can move itself, there must needs be something different from the organ, and which is the thing that moves it. The motion, we are conscious, is produced by impulse upon the organ; and as nothing can impel body but what has solidity and resistance; therefore I conclude, that what acts upon the organ is body as well as the organ itself †.

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* Page 67. *et sequen.*

† It is in this way that Aristotle argues against certain philosophers before his time, such as Heraclitus and Protagoras, who, as he says, maintained, that we were not sure of the existence of any thing except our sensations; and that, therefore, they were the only standard of truth and falsehood. According to this doctrine, says Aristotle, if there were no animals, nothing would exist, because there would be no sensation, which is an affection of an animal. Now, we may suppose that no animal exists, and therefore no sensation, the consequence of which would be, according to the notion of those philosophers, that no sensible object, that is, object perceived by the sense, exists. But it is impossible to suppose, that the things which produce the sensation should not exist, even without the sensation; for the sensation does not produce itself; but there necessarily must be something besides the sensation, which, in the order of nature, is prior to the sensation; for what *moves* is, by nature, prior to what is *moved*. The words are remarkable,

Further, that we have ideas, as well as perceptions by the sense, of sensible objects, I think it is impossible to deny. A geometer, for example, has undoubtedly the idea of lines and figures, concerning which he demonstrates so many things. Now, I would desire to know of those sceptical philosophers from whence we got these ideas. The common account given of them is, that they are abstracted by the mind from sensible objects. Now, if that be not the true account, I desire to know of those philosophers in what other way we come by them? If they cannot answer this question, they must acknowledge that their philosophy is very defective, as they cannot assign any cause for so common a phenomenon, of which it is impossible to deny the existence. The only answer, that I think it is possible to make, is one or other of these two; either, that those ideas are innate, and born with us, or, that they are communications made to us by superior minds. But I answer both these hypotheses by asking another very simple question, Why has not the blind man the idea of colours, or the deaf man of sounds, either innate, or by communication with other minds?

As to what is said, that, if the objects of the perceptions of our senses were any thing external, our perceptions, which Mr Hume chooses

able, and therefore I will give them. 'Ολως τ' ἔτις ἐστὶ τὸ αἰσθητὸν μοῖον, οὐδὲν αὖ ἐν μὴ
 ὄντι τὸ ἀναισθητὸν αἰσθητὸς γὰρ οὐκ ἂν ἦν. τὰ μὲν οὖν κατὰ τὸ αἰσθητὸν εἶναι, κατὰ τὸ αἰσθηματικόν,
 ἔστις ἀδύνατον· περὶ γὰρ αἰσθησιμότητος πᾶσι τοῖς ὄντι· τοῦ δὲ τὸ ὑπερκειμένης εἶναι ἂν ποῖεν τὴν αἰσ-
 θητὴν, ἀλλ' οὐκ αἰσθητὴς, ἀδύνατον. οὐ γὰρ ἂν ᾗ τὸ αἰσθητὸν, αὐτὸ ἑαυτοῦ ἐστὶν, ἀλλ' ἐστὶ τι
 ἕτερον παρὰ τὴν αἰσθητὴν ὁ αἰσθητὸς προτερον εἶναι τῆς αἰσθησιμότητος. το γὰρ κινεῖν τὸ αἰσθησιμὸν φύσει
 προτερον ἐστὶν. *Metaph. lib. 4. cap. 5. in fine.* He adds, Καὶ ἐκ ληγεται πρὸς ἀλλήλα ταυ-
 τὰ αὐτὰ, οὐδὲν ἄλλοι; which is stating an objection to himself, viz. that what moves,
 and what is moved, fall under the category of *relation*, or πρὸς τι, and are, as we express
 it, *co-relatives*, and therefore must exist together. But the answer is, that, though the
 one, therefore, cannot, in time, be prior to the other, yet it may be in dignity, and the
 order of nature, as the cause must necessarily be to the effect, though both may have
 been from all eternity, which is the case, according to Aristotle, of the universe and
 its author.

chooses to call ideas, would necessarily resemble the objects which we perceive, otherwise we could not know that we perceive them: And therefore our perception of a *solid*, *extended*, a *sweet* or *bitter* object, must be solid, extended, sweet, or bitter. This argument, I say, when attended to, proves nothing at all, and is really altogether unintelligible; for, when we consider that the perceptions of sense are produced by the pressure of external objects upon the organs of sense, which being from those organs communicated to the mind, causes therein a certain perception, that we call *sensation*, it is impossible to conceive how the perception or affection of the mind should resemble the object by which it is affected. We might as well conceive, that the sensation that we have from the prick of a sword should resemble the sword.

But, if Mr Hume had not confounded, as he every where does, the perceptions of sense with the ideas of intellect, he would have seen that there was a very great difference betwixt the perceptions themselves, and the ideas thence formed, and that there is some ground for Mr Locke's distinction betwixt the primary and secondary qualities of body; for it is the business of intellect to investigate the nature of things, and to find out the *species* or *idea* in the *material form*. Now, in certain objects perceived by the sense, it can do that with great accuracy. For example, with respect to its perception of *extension* and *figure*, it can distinguish length, breadth, and depth; and all the several figures, by which body is bounded, it can separate and discriminate one from another; and there can be no reason to doubt but that these ideas, thus formed, have their models and archetypes in the nature of things, and that the bodies thus bounded are the very objects which affect our senses of seeing and touching. And accordingly, we find that the science which we form of those ideas, applies perfectly well to all bodies. It is the same with regard to the ideas which we form from the perceptions of the sense of hearing; for of

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sounds we form a science and art, which we call *music*, and which also applies to the nature of things as they exist; so that neither is there here any reason to believe that the intellect is deluded by false appearances. But, as to the other three senses, of touching, tasting, and smelling, we have not hitherto been able to discover the nature and constitution of the objects which produce them, so as to be able to form ideas concerning them, of which science can be made. They continue, therefore, only to serve the purposes of animal life, and of observation and experience, without being reduced to science. Now, those qualities of body, such as solidity and extension, of which the mind can form distinct ideas, and which are so far of the nature and essence of body, that we cannot conceive body without them, Mr Locke calls primary qualities, and says that they have a real existence in the bodies; whereas the other qualities, of which we cannot form such clear ideas, he says, are only perceptions of the mind: And, if he had said more expressly, what it is evident he meant, that these perceptions are produced by certain qualities in the body, as well as those of which we can make science, and had added the reason why we can make science of the one set of perceptions, but not of the other, his philosophy would have been nowise imperfect or defective, and he would have sufficiently established his distinction betwixt primary and secondary qualities of bodies; the first being those of which we form clear ideas, the other those of which we know no more than that they affect our senses in a certain way.

What only remains to be considered, is the case of dreams, in which undoubtedly we perceive objects of sense, which sometimes make a greater impression upon us than what we perceive when we are awake. That our dreams have their seat in the phantasia, and that we see things when we are awake, by means of the same wonderful faculty, is certainly true. And it is likewise true, what Aristotle has

observed*, that the intellect employs itself upon these appearances in our sleep, reasons, and draws conclusions concerning them in the same manner as it does upon the appearances presented to us by our senses when we are awake. Where, then, it will be said, is the difference betwixt our waking and sleeping perceptions? and how shall we know that our whole life is nothing but a dream? And, indeed, if all the powers of the mind, as well as the power of perception, and the reasoning faculty, were employed in our dreams, I think it would be impossible to distinguish betwixt our waking and sleeping life. But the difference betwixt the two I take to be this, that, while we sleep, we have no exercise of memory, and, by consequence, no power of reviewing our former actions, and comparing the past with the present: For it is well known that we converse with persons in our dreams, who have been dead long before, as if they were still alive, without the least memory or recollection of their being dead.

I know it is said, and believe it to be true, that persons sometimes know that they are dreaming; but this happens very seldom; and, when it does happen, I am persuaded the person is in a state intermediate betwixt sleeping and waking, and always wakes very soon after.

Thus, it appears, that the mind, in dreaming, has not the full exercise of its faculties, wanting consciousness and reflection, by which our minds are more distinguished from the brute mind than by any thing else; so that it is not to be wondered that the brutes have dreams as well as we. On the other hand, in our waking state, we exercise all the powers of our mind; we have memory, recollection, consciousness, and reflection; we can review our actions and operations; can compare the state we are then in with the state we were in when asleep, and can show the difference betwixt the two.

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* Aristotl. *de Insomniis*.

In such a condition, therefore, we are able to distinguish betwixt illusion and reality, our dreaming, and our waking thoughts, and pronounce, with certainty, that the perceptions of sense, when we are awake, are produced by objects without us; whereas, when we are asleep, they are all from within, and the work of the phantasia only.

Nor are there wanting many examples of men, while awake, being in so imperfect a state of mind: For madmen, and persons in a delirium, have no recollection of their past actions, and act as if the phantasms of imagination were realities. Now, I consider a dream as a kind of short madness or delirium, of which we recover when we awake; and I think it as ridiculous to judge of truth and nature by what appears to the madman, as by what appears to the dreaming man.

Nor should it move us, that what we see in our dreams very often affects us as much, and sometimes more, than what we see when we are awake: For the fictitious scene we see upon the stage, or the representations of the magic lanthorn, affect us very much: But there is this difference betwixt these representations, and what is presented to us in dreams, that we know the former to be mere illusion; whereas we do not know the latter to be so, but take them for realities, unless when we are, as I observed before, upon the confines of sleeping and waking, and have the consciousness of our waking thoughts joined with our dreams.

Thus, I think, I have proved, that the scene which nature presents to us, is not an illusion, but consists of real objects, which, by impulse upon our organs of sense, produce all our sensations; and, as nothing can impel, or be impelled, that is not solid and extended, and, as every thing

thing that is solid and extended is body, I think I may conclude, that what exists without us, and produces our sensations, is body. And, though it be fleeting and transitory, and in a constant flux like a river, yet I think I have shown, that intellect can apprehend something of it as it passes, and make it a permanent object of art and science.

C H A P.

C H A P. VII.

Of the Nature of Reasoning by Induction—This Reasoning used both in Natural Philosophy, and in the ordinary Affairs of Life—From this Way of reasoning in Natural Philosophy, the Laws of the Motions of Bodies are inferred—From these Laws we reason downwards, and demonstrate—This is the Science of modern Natural Philosophy—The Evidence of those Laws of Nature very different from that of Axioms—The Reason for our Belief in these Laws twofold—Every Experimental Philosopher is, in some respect, a Theist, though he may not know it—Of Induction in the common Affairs of Life—of the same Kind with Induction in Natural Philosophy, but not near so certain—Reason of the Difference—Speculations concerning the Duration of this System of Nature and of Man do not belong to this Part of the Work.

AS from many individual material things we form ideas, or general ideas, as they are commonly called, so, from many propositions concerning such things, we form general conclusions ; and I propose, in this chapter, to inquire concerning the nature of this kind of evidence. It is a manner of reasoning, well known by the name of *Induction* ; by which, having discovered, by experience and observation, that a proposition, affirming or denying such or such a quality of a particular material thing, is true of a great number of particulars of the same species of things, we infer that it is true of all ; and we also infer, that it not only is so at present, but will continue to be so in

in time to come. And we may also carry this ratiocination to time past, and conclude that it *has* always been so. It is in this way, chiefly, that we reason in natural philosophy; and it is our only method of reasoning concerning the affairs of life. I will begin with our reasonings of this kind upon the subject of Nature.

It is by induction that we form all those general propositions concerning the motions and operations of body, which we call the laws of motion and of nature; for we can prove nothing concerning them *a priori*, not even that a stone falls to the ground. As little can we prove demonstratively, or *a priori*, that the motion of falling bodies is uniformly accelerated; a principle from which many consequences are reducible, relating to the velocity of falling bodies, the space through which they fall, and the time: Nor can we otherwise prove, though I believe the general opinion is different, that grand principle of mechanics, 'That the *moment* of every body is in a compound *ratio* of the mass of its matter, and its velocity;' for by no reasoning *a priori* can it ever be demonstrated, that as much as I take away from the mass of any body, if so much I add to its velocity, the *moment* or *weight* will continue the same.—In the same manner, we know, 'That, if one body, by impulse, moves another, 'as much as the body moved acquires of the motive force, so much 'will the body moving lose': Or, as the Newtonians chuse to express it, *Action and re-action are equal*: And in this way, and in no other, is it proved, that body, moved by impulse of another body, goes on in the direction of a straight line, and retains the motion communicated to it till it be retarded, or stopped altogether, by some contrary force. These, and other propositions concerning motion, being found always to hold in every instance in which they have been tried, from them general conclusions are formed, which we call *laws of nature*; and, considering them as axioms or self-evident propositions in natural philosophy, we reason downward from them, and in that way strictly demonstrate or prove *a priori*, that is, from *cause* to *effect*.

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And this I hold to be all the science that is in modern natural philosophy.

But these laws of nature are very far from having the evidence of *axioms*, properly so called ; for, as we do not know the essence of body, we cannot from thence deduce its properties, that is, we cannot demonstrate them ; and much less can we perceive them intuitively ; for we can see no contradiction in supposing that a stone should go upwards, as flame does, instead of falling downwards, such as we conceive in supposing that a *part* is equal to the *whole*.

Yet, that the stone falls to the ground, and that bodies are moved in the several other ways above mentioned, no body doubts ; but this universal belief does not satisfy the philosopher, and he still inquires, upon what grounds do men believe so ? The author of the *Essays* says, that it is *custom* which produces this belief *. But custom hath nothing to do with belief, or any of the operations of intellect ; it relates only to *practice* ; for, by being in the frequent use of doing any thing, we form the habit or disposition to do it. And this is common to us with the brutes, who have no belief or opinion of any kind, which is peculiar to the rational or intellectual nature. We therefore never believe without some reason, though perhaps that reason may not be attended to, and is only discoverable upon reflection. And the reason, in this case, I take to be twofold ; one of which operates upon the vulgar, the other upon the philosopher. The first is, that, having observed the same thing happen often, and not seeing any reason why it should not happen again, we believe that it will happen in time to come, and that it has happened in time past. This reason is only a negative reason, which has no other foundation than our ignorance

* Volume third of Mr Hume's *Essays*, sect. 3.

norance. But the reason of the philosopher is something more positive ; for he believes that the same thing that has often happened will happen again in the same circumstances, because he supposes that there is a system in nature according to which every thing happens regularly, orderly, and uniformly. And so far does the experimental philosopher carry this notion of a system, that, upon the credit of one experiment, made with great caution and accuracy, he firmly believes that the same effect will be produced, if the circumstances are exactly the same ; for he does not suppose that there is any thing in nature singular or anomalous, or that happens without some fixed or determined cause operating regularly and constantly. Nay, he goes still further, upon the supposition of the order and regularity of nature ; for, without one experiment, or the possibility of an experiment, he believes that one year is precisely equal to another in duration *, because he cannot believe that nature would be so irregular as to make the duration of one revolution of the earth round the sun unequal to that of another. And, in this way, I believe every experimental philosopher is so far a Theist, whether he knows it or not ; for it is impossible to believe, upon any rational ground, that there is a system in nature, without believing that, at the same time, there is intelligence.

Our reasoning concerning human life, and the affairs of men, grounded upon what we call *moral evidence*, is of the same kind ; for, by observing the same thing happen often, we conclude that, in like circumstances, it will happen again. For example, having observed ourselves, or learned from history, and the testimony of others, that men of such an age, and such a character, have, in such or such circumstances or situations, acted so or so, we believe that men of the same age, and same character, will, at other times, act in the same manner. Having also observed, that states, constituted and governed in a certain way, and having their citizens educated according to

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* Some of the antients appear to have doubted of this. See what I have said, p. 351.

certain rules, have acted in such and such a manner, and have been fortunate or unfortunate in certain circumstances and situations, we infer, that a state of the same kind, and in the same circumstances, will have the like fortune. In accurate reasoning of this kind, consist *prudence* and *political wisdom*: And from much experience in human affairs, no doubt, many general rules may be formed concerning both the conduct of private life, and the government of nations; yet such prudential and political rules are not near so certain as the laws of nature above mentioned; for, though there be a system in the affairs of men, as well as in Nature, it is far from being so constant, regular, and uniform, as the system of nature; the one being formed and carried on by infinite wisdom and power, the other an artificial system, framed and administered by an animal of weak intelligence and strong passions, and which, therefore, is liable to many disorders from within, as well as from without.

But how far are we to carry this notional system in the *natural* and the *moral* world? In the *natural* world, are we to believe that the same frame and constitution of things has always been, and will always continue to be? and, in the *moral* world, that men always have been, and always will be such, as we know from experience they are, and such as we are informed by history they have been for some thousands of years. Are we to believe that they will still continue to go on with the same vicissitude of characters and manners, virtues and vices, arts and sciences, happiness and misery; in short, with all the variety and uncertainty in their fortune and condition that has been for so many ages past? These are questions which no doubt belong to the *first* philosophy, but not to this part of it of which I am now treating, concerning the nature of evidence, and the foundation of human knowledge. I will therefore here conclude what I have to say upon the subject of proof by induction, after observing, that there is no proof of this kind, nor any evidence of facts, but upon the supposition

tion of what I have endeavoured to prove in the preceding chapter, that a material world exists.

In the next chapter, I proceed to examine the nature of an evidence of a very different kind, viz. geometrical evidence, which, however, I will show has some dependence upon material things.

C H A P. VIII.

Geometry, according to Plato, is all built upon Hypotheses, and does not demonstrate its own Principles.—It is only by means of the First Philosophy that it can be made a perfect Science.—In what Sense Geometry is founded upon Hypotheses.—Definitions and Postulates mere Suppositions.—Nature of Definition.—Euclid does not define Magnitude, the Subject of this Science; but supposes both that it is known, and that it exists.—Neither does he define any of the three Dimensions; but supposes them likewise known.—Euclid supposes Magnitude to be terminated by Superficieses, Lines, and Points.—Definitions he gives of these are to be explained by the First Philosophy.—No Definition of Equality by Euclid, but an Axiom in Place of a Definition.—Equality only belongs to Magnitude and Number.—Magnitude, the Standard of Equality, not only for itself, but for other Things.—That Magnitude is moved or changes its position, is another Geometrical Hypothesis.—This, and the other Hypotheses above mentioned, are General Hypotheses.—The Definitions are particular Hypotheses.—Difference betwixt Definitions and Postulates.—The Axioms result from the Definitions, and have their Evidence founded upon them.—All Geometry, therefore, hypothetical; and we can only say that its Hypotheses are possible.—To make it a Real Science, the Real Existence of the Material World must be proved.—The same is true of Arithmetic.

PLATO has said, that the principles of geometry are all hypotheses; and that, therefore, a science founded upon such principles, cannot be a perfect science*; for no science can be perfect which

* Plato de Republica, lib. 6. *in fine*, pag. 688. Edit. Ficini. And lib. 7. p. 704. where, speaking of geometry, he uses these words, 'ὅτι γὰρ ἀρχὴ μὲν ὅμη οἶδ', τὰ μὲν δὲ

which argues from principles that it assumes, without either demonstrating them, or showing them to be self-evident. By this he does not mean to disparage geometry, which he studied very much himself, and earnestly recommended to his scholars: But he says it is imperfect, compared with *dialectic*, which, in his language, is the same with what Aristotle calls the *first philosophy*, and is now commonly known by the name of *Metaphysics* *; because it does not demonstrate its own principles, but takes them for granted, or supposes them to be true; whereas, metaphysics demonstrates the principles of all sciences, as well as its own. It, therefore, I think, belongs to my subject, to show in what respect geometry proceeds upon hypotheses, and how metaphysics sets it upon a more solid and firm foundation, by showing the reality of those hypotheses. And this I think the more necessary, that there

και τα μεταξυ εξ ου μη οιδι συμπιπλυνται, τις μηχανη των τοιουτων εμολογιας ποτε επιστημη γινεσθαι; the meaning of which is, that 'what begins with that which it does not know, and when the end and all betwixt is connected with what is thus not known, that never can deserve the name of science' He, therefore, does not call it επιστημη, but διανοια, being, no doubt, an operation of the νοος, which is expressed by the word διανοια, but not proceeding from self-evident or demonstrative principles. Aristotle agrees with his master, that the principles both of geometry and arithmetic are assumed; for, says he, the one assumes that magnitude exists, the other that a monad exists. And he further says, that it is of necessity that all inferior and subordinate sciences should assume their principles, even such as may be demonstrated; because it is impossible they can be demonstrated from the principles of the science, being themselves the principles to be demonstrated. We must, therefore, go for the demonstration of them to another science, and that science is no other than the first philosophy, which, as it demonstrates the principles of all other sciences, may be called the *science of sciences*. Arist. Analytic. Posterior. lib. 1. cap. 9. and 10.

* We are not to confound the *dialectic* of Aristotle with the *dialectic* of Plato; for, as I have observed, the *dialectic* of Aristotle is the art of argumentation from common topics very well known, and much practised in the days of Plato, but not known by that name, though the practice of it was expressed by the verb διαλογεσθαι.

there are many, I believe, excellent geometers that never dreamed of this imperfection of their science; nor do I know any one in modern times who has handled this matter with any accuracy, except Dr Barrow in his mathematical lectures, who, besides being a great geometer, was very learned in the Greek philosophy, as he has clearly shown in those lectures, of which I have made some use in this chapter.

In the first place, if the subject of any science is not proved to have a real existence, that is, to be something in *rerum natura*, and not to exist merely in notion or idea, that science must be altogether hypothetical, and rather an *ideal* than a *real* science. Now magnitude, which is the subject of geometry, Euclid has not only not proved to have a real existence, but has not so much as defined it, leaving it to common sense to find out what it is, and also to be satisfied as to its reality.

Furthermore, the science of geometry is founded upon definitions, postulates, and axioms, which accordingly Euclid has premised to his demonstrations. Now, I will show that definitions and postulates are no more than suppositions, and that axioms are only propositions founded upon these suppositions.

Definition, as Aristotle tells us, is not a *proposition*; because it affirms or denies nothing *. Neither is it the signification of a word, explained by other words better known; for, if that were the case, our common dictionaries would, under every word they explain, give us so many definitions. But a *definition* † is the unfolding or development of a complex idea, into the several ideas of which it is composed; ‡ which composition is indeed commonly marked by one word, though

* Arist. de Interpretatione. cap. 5

though that be not at all necessary, but only convenient for the use of speech. There is, therefore, nothing affirmed concerning the idea thus developed, not even that it exists. There is one thing, however, necessarily implied in every definition, namely, that the ideas contained in the definition are of such a nature that they may consist together, or, in other words, that the association and combination of them is *possible*; for, whatever is not in its nature inconsistent, and contradictory, is *possible*; whereas, what is inconsistent, and contradictory, is *impossible*, because it cannot be conceived to exist. Thus, if I should define any figure to be a *round square*, that would be no definition, because it would be a definition of what is impossible. Every definition, therefore, is an hypothesis of what is possible.

Before I apply this to the definitions of Euclid, I will say something of the subject of this science, viz. *magnitude*, which, as I have observed, Euclid has not defined, for a reason which will appear immediately, namely, that it would have carried him out of the bounds of the science; for magnitude belongs to the genus of *quantity*, which is one of the categories. But it is the business of metaphysics to explain it, being one of the great constituent principles of the universe, without which no material world could have existed. And accordingly Aristotle, though he had said a great deal about it, in his categories, enough, as he thought, to make it understood as a praedicate of a proposition, has explained it most accurately in his metaphysics *. There he has described it to be that which is divisible into parts, each of which is *one*, and something by itself. And he divides it into two specieses, the one quantity *discrete*, the other quantity *continuous*. The former of these has its parts separated and disjoined one from another, and is what we call *number*. The latter is that which has its parts contiguous, and joined together by one common boundary. And

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* Lib. 3. cap. 1.

it is *measured* as the other is *numbered*; for, though the parts, into which quantity continuous is divided, may be numbered; yet that division into parts cannot be without mensuration, that is, the application of some quantity of the same kind to it; so that the capacity of being measured is the primary affection of this kind of quantity. It is a quantity of this kind that Euclid calls *magnitude*, and which is nothing else than body, or matter extended, but of which the extension only is considered by geometers, not the thing itself that is extended. Now, this extension is in three several ways, the distinction of which, as is natural enough, we have taken from the position of our own bodies; for, what is before and behind us, we call *length*; what is to the right and left of us, we call *breadth*; and what is up and down, with respect to us, we call *depth*. These are the three dimensions of body; and whatever has all the three, is called a *solid*, which Euclid has defined to be that which has length, breadth, and depth, or thickness. But he has not told us what any of these three are, leaving that also to common sense and apprehension. As to the real existence of body, and by consequence of its dimensions, the geometer proves nothing; but he goes upon the supposition that they do exist; and, as there is nothing impossible in the supposition, there is no reason why it should not be granted.

Further, geometry supposes that all magnitudes are not infinite or indefinite, but that some are terminated or bounded; and, therefore, that there is such a thing as *figure*, which is nothing else but *magnitude terminated*; this, also, is an hypothesis that must be granted.

This being admitted, the geometer proceeds, and says, that a *solid* is bounded by *superficieses*; and a *superficies*, as Euclid has defined it, is that which has length and breadth, but not thickness. That it must have length and breadth, is evident; but he has not told us why it has no thickness, leaving this likewise to the *first* philosophy to explain

plain, which is not difficult for him to do; for, if it had depth or thickness, it would not be the boundary or extremity of the solid; for it would have itself an extremity, which would be the extremity of the solid. This Aristotle shortly expresses, by saying, 'That an extreme must necessarily be different from that to which it is the extreme *.'

Further still, a superficies, if it be not infinite, which is contrary to the hypothesis, must have bounds or extremities likewise. The bound or extremity of a superficies is what is called a *line*, defined by Euclid to be length without breadth. But neither does he tell us why the line has not breadth, leaving this also to the metaphysician, who gives the same reason for a line wanting breadth, that he does for a superficies wanting depth, namely, that it would not otherwise be an extremity, for it would itself have an extremity.

Again, according to the hypothesis, a line also must have its extremities; and those extremities are called points, which, says Euclid, have no parts, though he does not add the reason, which is, that otherwise they would not be extremities.

All these consequences result from the hypothesis of magnitude limited: And, from the same hypothesis, there is another necessary consequence, that it must have a site or position, which, as Aristotle has observed, is what distinguishes essentially the subject of geometry from that of arithmetic; for *monad* and *number* have no site. Now, if magnitude have a position, it must necessarily occupy a certain portion of space, which is called its *place*.

And from hence we may collect the definition of *equality*, namely, occupying or filling the same space, of which Euclid has made an axiom, viz. axiom *eight*, though, I think, he rather should have put it among his definitions.

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* Phys. lib. 6. cap. 1.

And here we may observe, in passing, the truth of Aristotle's observation, that *equal* or *unequal* can only be applied to *quantity*, not to *quality*; for it is impossible that the definition of the equality of magnitudes can be applied to any thing but magnitude. And, as to numbers, the equality of them is made by their consisting of the same number of monads, which likewise cannot be applied to qualities *.

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* Quantity, therefore, is not only a standard by which it measures itself, but it is the standard by which every thing else is measured. Thus, without magnitude, there is not only no motion, but no mensuration of motion; for, we say motion is great or small, quick or slow, according to the space which the magnitude goes through in a certain time; and, as *time* cannot be without motion, so it is measured by motion; for it is measured by the space which the body that is moved runs through. Thus, what makes the year, is the space of the ecliptic, compassed by the sun. The measure, therefore, both of *motion* and *time*, is ultimately derived from *magnitude*. (See Aristot. Metaph. lib. 5. cap. 3.) The moment, or the weight of bodies, is, in the same manner, measured by magnitude; for that body has the greatest weight, that can raise up or impel forward the greatest magnitude. Even qualities, as far as they are capable of measure, are measured by magnitude and motion. Thus, the thermometer measures the degrees of heat and cold by the expansion of bodies; and it is in that way only we can say one degree of heat is *equal* to another; for, when we say so, we do not apply the term *equal* to the degrees of heat, but to the expansion of the magnitude; meaning, that, by the one degree of heat, the magnitude was as much expanded as by the other. But, as I have elsewhere observed (p. 391.), even that cannot be said with exactness.

As to quantity *discrete*, or *number*, it is a measure that applies to every thing that can be divided into parts corresponding to monads; and the use of it is still more necessary than the mensuration by magnitude; for, without it, men could not live at all in society, or carry on any of the common arts of life. The most wonderful application of it, I think, is to musical sounds, by which they are divided into notes; and the ratio of the notes to one another, according to their different degrees of acuteness or gravity, is ascertained by numbers. But even this was, at first, done by magnitudes, or weights stretching these strings; but, as the consequence of that was only to make the vibrations of the string more or fewer in the same time, it is ultimately by numbers that the ratio of notes is fixed.

That a magnitude should have a site or position, is absolutely necessary ; but it is not necessary that it should change its position, that is, should be moved : Yet this is a geometrical hypothesis, which every one, but a quibbling sophist, such as, they say, Zeno the Eleatic was, who contended that there was no such thing as motion, must admit. And the consequence of this movement of magnitudes is, that they may be conceived in any part of space, or in any position, with respect to one another.

These may be called the general hypotheses of geometry ; and I come now to speak of Euclid's definitions, which are only more particular hypotheses ; for he seems to have imagined, that those general hypotheses did not belong to his science, but that it was the business of the first philosophy to examine them, and to inquire whether they were to be admitted or no. Of his definitions of a point, line, and superficies, I have already spoken. The *fourth* definition is an hypothesis concerning a line, by which it is supposed to lie evenly betwixt its extreme points, and then it is called a *straight* line. The *seventh* definition, of a plain superficies, is an hypothesis of a superficies, in which any two points being taken, the straight line between them lies wholly in that superficies. The *eighth* definition, of a plain angle, proceeds upon the general hypothesis above mentioned, of magnitudes being capable of variety of positions, with respect to one another, and supposes that two lines in a plane incline one to the other, so as to meet, but not in the same direction. The definition of a right angle is, in like manner, taken from the position of one line, with respect to another. And the same is true, not only of all his definitions of angles, but of all his definitions of plain figures, that is, lines inclosing *space*. And what he calls parallel lines are lines supposed to be in such a position to one another, that, though produced ever so far at either extremity, they never will meet*.

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* That Euclid's definitions are all hypotheses, is the opinion of Proclus, in the second book of his commentary upon Euclid's First Book of Elements, p. 22. An authority

These are the definitions prefixed to the first book of his elements : And I might, in the same way, go over the definitions prefixed to his other books ; but enough, I think, has been said, to show, that Euclid's definitions are truly nothing more than so many hypotheses.

As a definition is an hypothesis of what is possible in theory, so a postulate is an hypothesis of what is possible in practice. The one is what may be conceived, the other what may be done. Of this kind are Euclid's three postulates ; for certainly a straight line may be drawn from any one point to another, which is his *first* postulate ; and, likewise, a terminated straight line may be produced to any indefinite length ; which is his *second*. And his *third* is, that a circle may be described from any centre, at any distance from that centre. This postulate might have been made more evident to sense, if it had been expressed in this way, ' That any circle may be described by the extremity of any straight line being moved round, till it return to the point from which it set out, the other extremity remaining fixed ;' for, this way expressed, we not only see the possibility of its being done, but we distinctly conceive the manner in which it is done *.

As

authority for which I have great respect, as he was not only a sublime metaphysician, but a good geometer. In this passage he says, that there is but one science that is *μεταφυσικη*, meaning Metaphysics.

* A circle would have been better defined in this way by Euclid, than by its property of having all the lines drawn from the circumference to the centre equal ; for every definition from the generation and production of the thing, is better than from any of its properties, after it is produced. In this way, Euclid has defined a sphere from the revolution of a semicircle about its diameter, when he might have defined it, as he has done the circle, from the equality of the lines drawn from its centre to its superficies. But, as Barrow has very well observed, (Mathematical Lectures, p. 223.) when a thing is defined by its generation, the possibility of its existence is evidently shown, and mathematical truth requires no more than that the subject of it should have a possibility of existence. In like manner, he has defined a cylinder from the turning of a parallelogram round its side, and a cone from the rotation of a triangle about its leg.

As to the axioms, they are all founded upon the definitions, being self-evident propositions, resulting from those definitions; for, if it be once admitted that magnitude has a certain standard by which it can be measured, viz. the space that it occupies, and that, therefore, one magnitude may be said to be equal or unequal to another; from these hypotheses, I say, all the axioms necessarily follow; for axioms, as I have observed, are only true, because, to suppose the contrary, would be a contradiction; and the contradiction is to some definition. For example, the axiom, that if two magnitudes are equal to a third, they are equal to one another, is true; because, to suppose otherwise, would be contradictory to the definition of equality; for, if the one was greater than the other, they could not be both congruous to, or occupy the same place as a third magnitude*. And there is one of Euclid's axioms that implies this contradiction to a definition still more evidently, and it is the 11th, which says, that all right angles are equal to one another; for, to suppose the contrary, would be, at once, to destroy the definition of a right angle. And, as all the demonstrations are deduced from definitions, postulates, and axioms, it follows, of necessary consequence, that, as Plato says, the whole science of geometry is *hypothetical*.

The question, then, is, what is to be done to make it a *positive* science, and to give it a real foundation in the nature of things, not in our ideas only; for it is not sufficient to explain, as I have done, the several hypotheses upon which Euclid proceeds, and to show that they are perfectly intelligible, and such as are at least possible to exist; but it must be further shown, in order to make geometry a real science, that they do actually exist; for we are not to imagine that, because Euclid has defined the several figures which are the subject of his demonstrations, therefore those figures do really exist. A man may define a *Hippocentaur* or a *Chimaera*, and, from such definitions, may draw consequences that are demonstratively true; but it will not from
thence

* See what I have said in explanation of this axiom, page 392.

thence follow that those animals do actually exist. Nor, indeed, are Euclid's definitions, properly speaking, definitions, except upon the supposition of the existence of the things defined; for, otherwise, they are not definitions of *things*, but explanations of *words*, because a definition expresses the nature and essence of the *thing* defined; and, therefore, of a non-entity, or *nothing*, there can be no definition. But I may give a name to a thing that has no existence, such as a Hippocentaur, or a Chimaera, and I may explain what notion or idea I affix to the word *. It is evident, therefore, that, upon the supposition of a material world not existing, Euclid's science is merely notional and nominal, without any foundation in the nature of things: So that it is necessary, in order to establish the *reality* of geometry and other sciences, to prove the existence of a material world. This I have endeavoured to do in a preceeding chapter; and, if I have succeeded, the consequence is, that *magnitude*, the subject of geometry, is not a mere notion, but a thing actually existing; and so is, likewise, *magnitude limited*, or *figure*. For, though, perhaps, there is not to be found a perfect geometrical figure, yet they all exist in the way that Michael Angelo said the statue existed in the block of marble, 'which,' says he, 'the statuary does no more than produce, by taking away what is superfluous.'

Arithmetic, too, would be merely a notional science, if there were no material world existing; for then there would be nothing that could

* This distinction betwixt the definition of a thing, and the explanation of a name, is stated by Aristotle, in his *Last Analytics*, lib. 2. cap. 7. and is explained, at great length, by Philoponus and Eustratius, in their commentaries upon the passage, where they have shown, that we may give a description of the notion we express by any word which will be sufficient for making our meaning understood, but will not be a definition of the thing. For example, when I speak of a man, I may say that I denote by that word an animal that walks erect, looks up, and speaks. This will sufficiently explain what animal I mean, but it is far from the definition of a *man*.

could be *numbered*, as there would be nothing, in the other case, that could be *measured*.

It may be further observed on this head, that, upon the supposition of no material world existing, not only those sciences of geometry and arithmetic would have been merely notional, but they never could have existed; for it is from the material world that both the geometer and arithmetician take their ideas of magnitudes and numbers.

As to Arithmetic, Euclid, in his book upon arithmetic, has defined well enough, for his purpose, the *monad*, which is the principle of *number*. He has said it is that by which every thing is said to be *one*; for it was not his business, as an arithmetician or geometer, to enter into a metaphysical disquisition concerning the *one*, and to show that it is necessarily connected with *existence*; and that the *ens* and the *unum*, as the schoolmen speak, are truly one and the same thing. But he has not been so fortunate in his definition of *number*, which, he says, is a multitude composed of monads*; by which he has plainly confounded two ideas, which are not only distinct, but, in some sort, opposite; for *multitude*, as well as *number*, consists of *monads*, that is, of separate and detached things, not of one continued body. And, accordingly, the barbarous nations, when their arithmetic fails them, and they want to denote multitude that they cannot number, they point not to the earth or sea, but to the hairs of their head, which are separated and detached one from another. Euclid, therefore, ought to have defined number, as Aristotle does, to be 'multitude defined 'or limited †.'

But,

* Εκ μονάδων συνημινομένη πλῆθος. 2d defin. lib. 2.

† Πλῆθος πεπερασμένον, and πλῆθος he defines to be το διαιρετὸν ὅταν μὴ ᾖ ἐν τινὶ, that is, *monads*. Metaph. lib. 5. cap. 13.

But, if Euclid has been unfortunate in this definition, he has been remarkably fortunate in his definitions of the several kinds of numbers, and their several properties and affections, which are expressed with a clearness, and a brevity at the same time, that are really wonderful. Of this kind, particularly, is his definition of proportion in numbers, which is as shortly expressed as his definition of proportion in magnitudes prefixed to his fifth book, but much more clearly.

Aristotle has observed *, that the point, as well as the monad, is indivisible; but the difference betwixt them is, that the monad is not only indivisible, but it has no site or position; whereas the point has a site. And, indeed, the monad is one of the most abstract ideas that we have; for it separates from the thing every affection or quality except existence and unity; which, with respect to single things, are truly the same; for we never have the idea of a single thing, but we consider it as *one*. And, accordingly, in common language, we say *one single thing*.

As to the composition of *monads*, or *number*, besides being *multitude defined*, it has *order*; for it has not only a regular progression upwards, but in all its compositions by multiplication, and in its ratios, that is, the relation of one number to another, there is a wonderful regularity, very little known to our modern mathematicians, but which was very much studied by the antients, as is evident from the treatise upon arithmetic of Nicomachus, a Pythagorean philosopher of later times.

And here we may observe the reason why the Pythagoreans made *number* the symbol of immaterial and divine things; for, besides that they are the most abstract of all ideas derived from sensible objects, being divested of all the common properties of material things, even time and place, they have order and procession, such as the Pythagoreans

* Metaph. lib. 5. cap. 6.

reans conceived to be in the Divinity. And the principle of Divinity, as well as of Number, is *unity* perfectly indivisible *.

L 11

Plato,

* It is a strange fancy of Dr Barrow, in his Mathematical Lectures, p. 29. that geometry is, in the order of nature and in dignity, prior to arithmetic; magnitude being, according to him, the primary idea, of which number is only an affection, serving for no other purpose but to number the parts of magnitude. In this, as in other things, the Doctor had done better to have followed his guides, the antients. It is a crude thought of the Doctor's, which he has endeavoured to support by reasons that I think are not intelligible; for magnitude is, as I have observed, not so simple an idea as number, including, besides existence, space, and position in that space. And, *secondly*, number, and its principle, the monade, are so much primary ideas, that, without them, we have no idea of any thing else. As to magnitude, if we were to consider it as infinite, we must conceive it as one thing, and we must also consider it as consisting of a multitude of parts contiguous to one another: So that the most simple conception we can have of magnitude involves both the *one* and the *many*, besides space and situation. But, when we consider magnitude as bounded, the case is still clearer; for we can have no idea of the simplest rectilineal figure, viz. a triangle, without first having the idea of the number *three*. The Doctor, in his reasoning upon the subject, seems to confound *measure* with *number*; for measure is certainly an affection of magnitude only, and therefore belongs to geometry only. But, when the parts measured come to be numbered, then there is the application of another science to geometry.

It is to be observed, that the antients not only distinguished betwixt the monade and number, but would not allow the duad to be number; for, they said, it was no more than a step of progression from the monade to number; therefore was betwixt the two, and neither the one nor the other. It was quite different from the monade, in this respect, that the monade is not increased by being multiplied into itself, but only by being added to itself; whereas, the duad is increased by multiplication, as well as by addition; and it differs from number in this respect, that number is more increased by being multiplied, than by being added to itself; whereas, the duad is just as much increased by being added to itself, as by being multiplied by itself; so that it is plainly betwixt the two, and participating something of each. This is an observation of Proclus, in his second book of his Commentary upon Euclid, page 45. See also Jamblichus's Commentary upon the Arithmetic of Nicomachus. Such observations upon the principles of number are little attended to in modern times. But this distinction betwixt the duad

Plato, in his seventh book *De Republica*, has observed, with great justice, that there is no science which abstracts the mind so much from matter and sense, as arithmetic. It does so, he says, much more than geometry, the subject of which, viz. lines and figures, have position, and are represented to the mind by material symbols ; whereas numbers are so much abstracted from matter, that they cannot be expressed by any material form ; so that the mind, in the study of them, is obliged

duad and number appears to have been known even to the grammarians, who, in antient times, formed a language according to the rules of art. And, accordingly, we find the Greek language, and other antient languages, which were the work of men of science, had a dual number. See what I have further said on this subject in the *Origin and Progress of Language*, vol. 2. book 1. cap. 8. p. 88.

Proclus, in the passage above quoted, observes, that the science of magnitude, as delivered by Euclid, proceeds in the same manner as the science of number ; for Euclid begins his definitions of figures with the circle, which is the simplest of all figures, being contained under one line, and therefore like to the monade of the arithmetician. Then he proceeds to the semicircle, which may be called the *duad* of magnitude, as it is contained by two lines, the one a straight line, and the other a curve. And from thence he goes on to the triangle, which may be called the first numerical figure. In this manner, the antients compared things together ; and, by discovering resemblances between things seemingly most different, such as figures and numbers, formed systems of science, of much greater extent and comprehension than what is to be found among us. Proclus, in this work, not only carries on the analogy betwixt numbers and figures, but he finds out wonderful resemblances betwixt the first philosophy and both geometry and arithmetic ; explaining, after the manner of the Pythagoreans, by figures and numbers, the procession of Divinity, and the progress of mind in generation and production. This he may have carried too far ; nor do I think the metaphysical part of this work the most valuable part of it : But the geometrical part I think admirable ; for he has explained the principles of geometry, and shown the method of reasoning in that science, compared with that in other sciences, better than any body. This he was able to do by being a philosopher, and a man of universal knowledge, as well as a very good geometer ; whereas, the mere geometer, though he may improve several of the arts of life, and may be also useful to the philosopher, yet he himself does not understand even the principles of his own science, nor what rank it holds in the *Encyclopedie*, or system of universal learning.

ged to be conversant with the pure ideal form, altogether unassisted by the senses.

And yet, however remote numbers may be from sense and sensible objects, it is certain that the knowledge of them was the first thing like science among men. The reason of which is, that men could not live together in society, nor carry on any common business, either for their sustentation, or for their defence, without the use of numbers *. Now, *necessity*, according to the common saying, is the mother of invention; and therefore it is not to be wondered, that so urgent a necessity produced so early even these most abstract ideas of numbers, in which they were so far assisted by the senses, that whereas other ideas are abstracted only from particular senses, such as our ideas of visible objects from the sight, of audible objects from the hearing, the idea of number is furnished by every sense; for we distinguish *one, two, three*, not only in what we see or hear, but in what we touch, taste, and smell. And further, we have the idea of it from the consciousness of what passes in our own minds; for we know that we have different thoughts, in order one after another, and which, therefore, we can count.

Thus, I have endeavoured to show in what sense geometry is a hypothetical science; and that even arithmetic, though a more abstract science than geometry, is hypothetical, in so far as it supposes the existence of things to be numbered.

L I I 2

In

* It is well observed by Plato, *de Republica*, lib. 7. p. 697. edit. Ficini, that it was a most absurd fiction of the tragic poets in Athens, that Palamedes, at the siege of Troy, invented numbers, and taught the Greeks to count their army and their fleet; as if it had been possible that the Greeks were so far advanced in the arts of life, as to have government, religion, and navigation, and to carry on so great a war on the other side of the sea, without the use of numbers. 'What a ridiculous general,' says Plato, 'would Agamemnon have been, if he had not known how many legs or arms he had!'

In the preceding chapters, I explained the different kinds of reasoning, such as the *scientific* or *demonstrative*, the *analytical*, the *dialectical*, and the *inductive*. But there is one kind of reasoning, and which is of daily use, that I have not yet mentioned, viz. the *reasoning from examples*; by which I prove, that, because such a thing happened in such and such circumstances, the same thing will happen in like circumstances. That this reasoning is not demonstrative, is evident. But, in order more clearly to understand the nature of it, we must have recourse to a division of reasoning made by the philosophers of the Peripatetic School. All reasoning, they said, is either from greater to less, from less to greater, or from equal to equal*. From *greater to less*, that is, from *generals to particulars*, is the demonstrative reasoning, if the premisses be self-evident propositions, or demonstrated truths: If not, the reasoning is only of the dialectical kind. From *less to greater*, that is, from *particulars to generals*, is reasoning by *induction*. And from *equal to equal*, that is, from one particular to another that is like it, is *reasoning from examples*. And, besides these, there is no other method of reasoning; for the analytical is rather a method of investigation than reasoning: Or, if it is to be accounted reasoning, it is of the inductive kind, proceeding from consequences to principles, that is, from *particulars to generals*.

C H A P.

* See Philoponus's Commentary on the first book of Aristotle's *First Analytics*, fol. 10.

C H A P. IX.

The Non-Existence of the Material World no Discovery of our Scots Philosopher—But, that we have no Idea of Cause and Effect, a Discovery claimed by him—But this no discovery of his in the Sense in which he seems to understand it—In the Sense to which his followers have extended it, it is a Discovery, but a false one—That we have the Idea of Cause and Effect, in Matters of Science, proved by the Authority of Aristotle—and by the Reason of the Thing—Definition of Cause—The general comprehends the particulars under it, which therefore depend for their Existence upon the general—Difference betwixt Demonstrative and Inductive Reasoning—Nature of Causality in Matters of Science—very different from Causality in Facts of Natural or Civil History—Truth, Divine as well as Eternal.

IN the preceding chapters, I have shown that, upon the supposition of there being no material world, human knowledge has no solid foundation; and, that even those sciences which seem to have the greatest certainty, such as geometry and arithmetic, are like our dreams, in which our reasonings are sometimes very just and conclusive, but unsupported by fact and reality.

The doctrine of the non-entity of matter was not, as I have observed, a discovery of our Scots philosopher. But what I am now

to speak of in this chapter, he gives as a discovery of his own ; and a most wonderful discovery it is, I know, thought to be by his followers. It is this, ' That we have no idea of *cause* and *effect* ;' ' for,' says he, ' what we call a *cause*, is nothing more than an event, which, by ' experience and observation, we have always found to precede another ' that we call the *effect* ; but, that the one produces the other, that is, ' is the *cause* of the other, we have no knowledge at all. We perceive ' that the two events are *conjoined*, but not *connected*.' From his reasonings on this subject, and the particular instances to which he applies the general proposition *, we should imagine that he carried it no farther than to facts, and natural and human events. But, considered in this view, it is certainly no discovery of Mr Hume's ; for every philosopher knows that we can only reason concerning such events from induction ; and, that such reasoning is not demonstrative, for the cause which I have assigned in the chapter upon the subject of that sort of reasoning, but only probable. And this Mr Hume acknowledges. But, in the end of his dissertations upon this subject, he seems to have carried the matter further ; for he has given us a general definition of *cause* and *effect*, which may comprehend every matter of science †. And I know that several of his followers carry his doctrine so far ; the consequence of which is, to overturn all science and demonstration. But this, I am persuaded, was not intended by Mr Hume, at least, not in this part of his work. And the principal reason, as appears to me, why he has insisted so much upon this notion of cause and effect, is, that he might draw the notable conclusion, which he draws in the end of one of his Essays ‡, viz. ' that, as the production of the world by the Deity is a ' single event, to which we, by experience, know nothing similar ;

' there-

* See vol. 3d of his Essays, § 4. and 5.

† Vol. 3. sect 7 p 111. The definition is, ' An object followed by another, and ' where all the objects, similar to the first, are followed by objects similar to the second.'

‡ Essay upon a Providence and a Future State, vol. 3. p. 207.

'therefore we can have no idea of God's being the author of the universe.'

To refute this so impious assertion, does not belong to this part of my work ; nor is it necessary, I would fain hope, for the greater part of my readers. But some of Mr Hume's school having, as I said, carried his doctrine of our having no idea of *cause* and *effect*, so far as to overturn the principles, not only of theology, but of every other science, and of all demonstration, I think it is proper, in this place, to vindicate those principles, and to defend them against such an attack, which is grounded, as I think I shall be able to show, upon absolute ignorance of the nature of science and demonstration.

That, in all demonstration and reasoning *a priori*, we argue from generals to particulars ; as, on the contrary, in reasoning by induction, we argue from particulars to generals, is a fact that cannot be denied. And further, it is equally certain, that the particulars which are inferred from the generals are some way or another *connected* with them ; so that they are not only *conjoined* but *connected*. Here, therefore, is that *connection* which Mr Hume desiderates with respect to facts or events ; for which reason, he denies that we have any idea of the one being the cause of the other. The only question, therefore, is, Whether the connection, which undoubtedly is betwixt the generals and particulars from them inferred, or, in other words, betwixt the premisses and conclusion, in demonstrative reasoning, is such a connection as that upon which we bestow the name of *cause* and *effect* ?

That the two first propositions in a syllogism are the *cause* of the conclusion, has been the opinion of all philosophers ever since there was a system of logic known ; and, particularly, it is the opinion of Aristotle,

Aristotle, the author of the Syllogism, most explicitly declared *. But, as the authority of Aristotle is now become obsolete, and, as we live in an age when the clearest principles are called in question, I will endeavour to prove it in form.

And, in the *first* place, I will give a definition of *cause*, which shall be shorter than that of Mr Hume's, and, I think, fully as clear. *Cause*, I say, is, 'That without which another thing, called the *effect*, 'could not exist.' This is a definition which, I think, cannot be controverted; and, if so, I ask any geometer, Whether the idea of a triangle, as contained in its definition, is not the cause of all its properties, as being that, without which, those properties could not exist. If it be asked, How those properties do thus depend for their existence upon the definition of a triangle? the answer is, that the idea of a triangle is more general than that of any of its properties, as it virtually comprehends them all; so that they all flow from it, and are produced, as it were, out of it; for that is the nature of this causation. For the same reason, any of Euclid's axioms is the cause of the proposition which he proves by them. As, for example, the axiom, 'That, if any two things are equal to a third, they are equal to one another,' is the cause, that any two particular lines being equal to a third, they are equal to one another; for the lines or figures could not be equal if the axiom were not true: And the axiom being the more general proposition, virtually contains in it the particular proposition concerning these lines which flows from it, and is educed out of it. And the *effect*, in this case, has that dependent existence which every

* Analytica, Post lib. 1. cap. 22. Where, speaking of *ἐπιστήμη*, or science, he says, that we only understand a thing, or know it scientifically, when we know the cause of it. *ὅταν τὴν αἰτίαν συνιπύσῃ νοήσῃ, δι' ἣν τὸ πρῶτον ἐστίν.*—And again, in the same chapter, he says, that science or demonstration is, when the premisses are the cause of the conclusion. *ἀνάγκη τὴν ἀποδεικτικὴν ἐπιστήμην, εἰ ἀληθὴν εἶναι, καὶ πρῶτων, καὶ ἀμεινῶν, καὶ γνωριμωτέρων, καὶ πρῶτων, καὶ αἰτίων τοῦ συμπέρασματος.*

every *effect* must have upon its *cause* ; for the two lines would not be equal if the axiom were not true : Whereas, on the other hand, the axiom would have been true, if these particular lines had never existed ; so that there is no mutual or reciprocal dependence in the case.

And it is the same with *ideas* that it is with *propositions* ; for the more general idea is the cause of the particular idea under it, because it comprehends it. Thus, the idea of *animal* comprehends *man* ; the consequence of which is, that *man* could not have existed without *animal*, but *animal* might have been without *man*. Therefore *animal* is the *cause* of *man*, according to the definition that I have given of *cause*, but not *man* of *animal* : So that, in the whole process of the human mind, the formation of our ideas, as well as our reasonings, what is general is prior in excellence and dignity to what is particular, which is included in it, and produced out of it.

And here we may very clearly see the difference betwixt inductive reasoning and demonstrative ; for, tho' the induction were never so full, suppose the thing could be shown to hold in ten thousand different instances, yet we never could from thence infer that it was universally true. And why ? Because *particulars* do not contain the *general*, but *the general the particulars* ; therefore the *general* is the *cause* of the *particulars*, but not the *particulars* of the *general*. And, if it were otherwise, all Euclid's reasonings from definitions and axioms would be no better than inductive reasoning. For it is certainly true, what Aristotle says *, that there is no demonstrative or syllogistical reasoning, of any kind, in geometry, or in any other science, without a general proposition, from which the particular proposition made use of in the syllogism is deduced. Of this Ari-

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stotle

* First Analyt. book 1. cap. 24.

Aristotle gives us an example from geometry, in a very curious demonstration*, which he gives us of the fifth proposition of the first book of Euclid, concerning the equality of the angles at the base of an isosceles triangle. And the same may be said of every demonstration in Euclid; for it is only upon the supposition of the general proposition being true, that any step of the demonstration proves any thing. Thus, for example, if, in any demonstration concerning a triangle, it be assumed, That the three angles of that triangle are equal to two right ones, this proves nothing, unless the general proposition be admitted, That the angles of all triangles are equal to two right ones. This being admitted, I syllogise thus: All triangles have their angles equal to two right ones. This figure is a triangle. Therefore this figure has its angles equal to two right ones. Those gentlemen, therefore, who deny that the *particular* proposition is deduced from the *general*; or, in other words, that the *general* is the cause of the *particular*, must deny, at the same time, the truth of every demonstration of Euclid.

Further, I say that, in demonstration, we not only argue from *cause* to *effect*, but the demonstration evidently shows us how the *cause* produces its *effect*; for when from the definition of a triangle any of its properties is deduced, we clearly perceive how the definition is the *cause* of that property. And how any axiom, or proposition, formerly demonstrated, produces the inference that we draw from it, in demonstrating any proposition, is self-evident.

The reader that has learned his logic, and, particularly, if he has read the two books of Aristotle's *Last Analytics*, will be surprised that I have been at so much pains to prove a proposition that must appear to him perfectly evident; for Aristotle, in these books, has shown, that demonstration must not only be from the *cause*, but from the *primary* and

most

* Aristot. *ibid.*

most general cause ; so that, if the proof be from a *particular cause*, when there is one *more general* comprehending the *particular*, it is not demonstration properly so called. This he makes plain, not only to those who have studied his logic, but to such as know a little of the elements of geometry ; without which, it appears, that he thought no man was capable of learning logic, or any other science. If a man, says he, only knows that an isosceles triangle has its three angles equal to two right angles, he has no science or demonstrative knowledge of that proposition ; because, though he may, no doubt, demonstrate that an isosceles triangle has its angles equal to two right ones, yet, if he do not demonstrate it from its true *cause*, viz. the nature of the triangle in general, he cannot be said to know it scientifically. Now, That all triangles have their angles equal to two right ones, is the *general* proposition, That one species of a triangle, viz. the isosceles, has this property, is a *particular* proposition, comprehended under the *general*. Now, I ask any geometer, Whether the *cause* of an isosceles triangle having this property, is not, that all triangles have it ? or, as Aristotle has expressed it, Whether it be not *qua* triangle, not *qua* isosceles triangle, that it has this property *? If so, it is evident that, at least in this instance, the *general* proposition is the *cause* of the *particular* ; and, for the same reason, it is so, in every instance.

Thus, it appears, not only from the authority of Aristotle, but from the reason of the thing, that, to suppose we have no idea of *cause* and

M m m 2

effect,

* See Analytica Posteriora, lib. 1. cap. 24. His words are, Εἰρηρ το δὲ τὸν οὐκ εἶναι ἴσους, μηδ' ἴσους, ἀλλ' ἢ τριγωνοῦ· ὁ εἶδος ἐστὶ ἴσους, ἢ τὸν οὐκ εἶναι ἴσους, αἱ (lege εἶ) ὁ εἶδος ἐστὶ τριγωνοῦ. Ὅλος τε, αἱ μὴ μὴ οὐκ εἶναι ἴσους, εἴτα δὲ αἱ οὐκ εἶναι ἀποδείξεις. And, a little farther, he says, Εἰ δ' ἀποδείξεις μὴ ἐστὶ συλλογισμὸς τῆς αἰτίας καὶ τοῦ διὰ τὸ τοῦ καθόλου δ' αἰτιώτερον· ἢ γὰρ καὶ αὐτὸ εἶναι τὸ, τοῦτο αὐτὸ αὐτὸ αἰτία· τοῦ δὲ καθόλου, πρῶτον αἰτία ἀπὸ τοῦ καθόλου.

effect, in matters of science, is to overturn all science and demonstration.

The reader will observe that, in my definition of *cause*, I have not mentioned priority of time: And the reason is, that it has nothing to do with this kind of *causation*; for the corollary is an eternal truth, as much as the proposition from which it is deduced. And what is proved by the axiom, has been true from all eternity, as well as the axiom. And the reason of this is plain; for, as in demonstration, we argue from *general* to *particulars*; and, as the *particulars* are *parts* of the *general*, and contained under it, it is evident that the *parts* of any *whole* must be co-eval with the *whole*.

And it is in this sense that truth may be said, not only to be *eternal*, but *divine*, because, in this respect, it resembles the productions of Divinity, which we conceive to be eternal, as their author. Thus, we say that the second and third persons of the Trinity, proceeding from the first, are co-eternal with the first, and yet of existence dependent upon him. And, in the same manner, the antients, as I have observed, conceived the material world to be an *eternal emanation* of the *Eternal Cause*.

But it is otherwise with respect to things that are in generation and corruption, or *the corruptible things of this world*, as they are called in Scripture; for there, the *cause producing*, is always prior in time to the *effect produced*. And this is the common notion of cause and effect; for the vulgar have no idea of that *Divine causation* which I have just now endeavoured to explain.

Thus, I have shown that, in matters of science, we have a clear idea of cause and effect, and perceive distinctly how the cause produces the effect; and that this is so essential to science, that, without it, there is no science. As to facts of natural and civil history, I have
shown,

shown, in the chapter concerning the nature of inductive reasoning, that, though we have no scientific knowledge of cause and effect, which it is impossible, by the nature of things, that we should have, yet every man who believes in God, and, by consequence, in an established system and order of things in the universe, has sufficient ground to believe that the events which constantly *precede*, are the *cause* of those which constantly *follow*.

CHAP.

C H A P. X.

All the Antient Philosophers believed in the Existence of Ideas.—Differed only as to the Manner of their Existence.—That Ideas and Sensations are the same, a Discovery of Modern Times.—Plato's Opinion concerning Ideas.—This truly his Opinion, not falsely imputed to him by Aristotle.—Aristotle's Opinion concerning Ideas.—These, according to his Philosophy, are of three Kinds.—That there are Ideas existing in our Minds, is a Matter of Fact, to be proved by Induction.—Examples from the Works of Art.—Ideas formed, in the like Manner, from the Works of Nature.—Of these Ideas, all the different Kinds mentioned by Porphyry.—That we have the Faculty, by which Ideas are formed, viz. Intellect, and are thereby distinguished from the Brutes.—Reason for arguing in this Manner from Art to Nature.—Distinction of Ideas into Corruptible and Incorruptible.—Aristotle reconciled with Himself as to such Ideas.—In what Sense Ideas may be said to have a Being distinct from Particulars.—This Distinction explained, and shown to be made by every Body.

AS there can be no demonstration or reasoning of any kind, without ideas or generals, it behoves an author, who has undertaken to lay down the principles of human reasoning, to explain accurately the nature of ideas, and to answer every objection that may occur to them.

There were, in antient times, but two opinions concerning ideas, that of Plato, and that of Aristotle, both agreeing as to their *existence*,
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and differing only as to the *manner* of their existence ; for it is a discovery that was reserved to modern times, that there are no ideas, and that all the perceptions of the human mind are nothing but sensations more or less lively. Even the materialists, such as the Epicureans, did not, as far as I know, deny the difference betwixt sensations and ideas ; nor did Pyrrho, who doubted of the existence of the material world, and denied that truth was to be discovered with certainty in any thing, dispute the existence of ideas in his own mind.

The opinion of Plato upon this subject, was likewise the opinion of the Pythagoreans, from whom it is evident, that Plato took his whole philosophy, his morals, physics, and metaphysics, and, among other things, his doctrine of ideas, which was this : ‘ That the *ideas* or *forms* of things, in contradistinction to the *matter*, not only have an existence, but a separate existence, subsisting by themselves, out of the mind of any intelligent being.—That they are immaterial substances, not only animated, but having intelligence.—That, from those ideas, proceed all the variety of things in this universe, which, by participation of them, are each the thing it is, and distinct from every other thing, deriving from the idea of which it participates its nature and denomination. Thus, for example, a *man*, by participating of the idea of *man*, has the nature of a man, and is so denominated. In like manner, a *horse* is a *horse*, and so of other animals ; and not only did substances exist by the participation of those ideas, but also qualities and properties ; thus, a thing was *one* by the participation of the idea of *one* ; and it was *good* or *fair*, by the participation of the ideas of *good* and *fair* ; yet those ideas, thus mixed and incorporated with so many different subjects, were not therefore divided or discripted, but still retained the unity and integrity of their nature ; and, therefore, in the language of the Platonists, the idea is the *thing itself* *, pure and

* This they called *αὐτὸ ἀνθρώπου*, *αὐτὸ ἵππου*, *αὐτὸ τὸ καλόν*, *αὐτὸ τὸ ἀγαθόν*, &c.

‘and unmixed with every thing else ; whereas, the subjects that only
 ‘participate of it, and from thence receive their denomination, are no
 ‘more than imperfect resemblances of it, in which there is always a mix-
 ‘ture of *matter*, and likewise of other ideas ; so that, to single it out by
 ‘itself, and to perceive the pure *ideal form* by itself, separated from e-
 ‘very thing *material*, and from every other idea, is the highest perfec-
 ‘tion of human reason.’

This was the opinion of Plato †. As to Aristotle, he denied the
substantiality or separate existence of ideas, and maintained that they
 only

† There are many, at present, who cannot believe that Plato maintained an opinion,
 which seems to them so absurd ; and it appears, from a passage of Philoponus’s com-
 mentary upon the First Book of Aristotle’s *last Analytics*, folio 53. That there were
 some in his time who said, that Plato, when he spoke of his ideas as being *real* things,
 meant no more, than that they *really* existed in the mind of the Deity : And, in this
 way, they endeavoured to reconcile the master and the scholar. But this explanation
 of the ideas of Plato, Philoponus rejects. And in this, and another passage in his
 commentary upon the Second Book of Aristotle’s *Physics*, he expressly asserts, that
 Plato maintained his ideas to be substances, having a separate existence by themselves ;
 whereas, the ideas of Aristotle existed primarily only in the supreme intelligence,
 and from thence were derived to *corporeal forms*, and from them to human intelligen-
 ces. And, indeed, it is impossible to believe that Aristotle, whatever freedom he may
 have taken with more antient philosophers, would have imputed such an opinion to his
 master, and disputed against it at so great length, if it had not been really his opinion,
 when he could have been contradicted by so many living at the time he wrote. And,
 besides, as Philoponus has observed, in the passage above quoted from his commentary
 upon the *last Analytics*, we know, from what is preserved of the history of those two
 philosophers, that it was the chief point upon which they differed ; and that Aristotle,
 even during the life of Plato, disputed with him very warmly upon that point.

And, if there were any doubt in the matter, Plato himself has said enough to con-
 vince us, that his scholar did not misrepresent his opinion ; for, in the *Parmenides*,
 where he treats professedly of ideas, he says expressly that the idea exists, *οὐκ ἔστιν ἡ*
ἰδέα, and denies in so many words that it exists in our minds, p. 1114. *Editio Ficini* : And
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only existed in the mind of an intelligent being. Originally, according to him, they exist in the divine intellect, where they form what we call the *intellectual* world. From thence proceeds the *material* world, which is a copy of all those *forms* or ideas, primarily existing

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the contrary opinion, that it is only a conception of our minds, and exists only there, is stated and endeavoured to be refuted p. 1113. And there is a passage in the *Sophista*, p. 174. *Edit. Ficini*, where he speaks of ideas, not only as having a separate existence, but tells us what sort of beings they are, viz. beings endowed both with life and intelligence. And, indeed, it is impossible that he could have spoken of them in so mysterious a manner, as he has done in the *Philebus*, and many other dialogues, representing them as beings of a most wonderful kind, which, continuing always one and the same, do nevertheless exist entire and undivided, in an infinite number of things at the same time, if he had believed them to be only notions in the mind of an intelligent being.

Nor do I think that Aristotle has done his master any injustice in representing his opinion to be, that the ideas were in particular and material things *κατα μίθεσιν*, or *by participation*, not κατ' ὁμοιωσιν, or *as a copy*. Aristotle's *Metaphys.* lib. 2. cap. 6. For, though, in the *Parmenides*, he states both opinions, yet, I think it is evident, from what he says there, and likewise from some passages in the *Philebus*, and other parts of his works, that his opinion was, that the ideas existed in particular things *by participation*. And it is further true, what Aristotle says, *dicto loco*, that he has nowhere explained the nature of this *participation*, but every where talks of it as a most mysterious thing.

And Aristotle has not only truly stated the opinion of his master upon this subject, but he has accounted how he came to be of that opinion; for, says he, in his younger days, he learned the philosophy of Heraclitus, which taught, that all material things were in a constant flux, so that of them there could be no science; and this opinion he retained to the last. But having studied the philosophy of *morals* under Socrates, and having learned from him to investigate generals, and to *define*, he thought that it was impossible there could be any definition of material or particular things, which were continually changing; and therefore he supposed another kind of beings, of fixed and permanent existence, and which therefore were the proper objects of definition and science. These he called *Ideas*, and said they only were the *τα ὄντα*, or *things really existing*; and therefore to find out this *τὸ ὄν* upon any subject, is, in the language of Plato, to discover the truth. See Aristotle *ubi supra*, Metaphys. lib. 1. cap. 6.

in the Divine mind. The first kind of ideas, the Peripatetics called *πρὸ τῶν πολλῶν*, or, *before the many*. The other kind, they said were *ἐν τοῖς πολλοῖς*, or, *in the many*; and these last are the *substantial forms* of the Peripatetics, that is, the form which gives the substance or essence to the thing, and makes it what it is. And last of all come the ideas in our minds, which, being formed from *the many*, and only in consequence of their existing *in the many*, are said to be *ἐπὶ τοῖς πολλοῖς*; and as we get them by abstracting the forms of material things from the matter in which they exist, they are properly enough called *abstract ideas*, in contradistinction to the two other kinds, those existing before *the many*, and those *in the many*. But it is very improper to use those terms when we speak of ideas in general, as if there were no ideas, but what were abstracted from matter. And it is still more improper to distinguish, by that appellation, *ideas* from *sensations*, as if sensations were ideas, only not abstracted from matter; and, as if it were not of the utmost consequence in philosophy, and indeed the foundation of all philosophy, to distinguish particulars from generals.

Whether Plato's doctrine of ideas deserve the censure which Aristotle has thrown upon it, of being no better than the flourish of a musician *, that is, mere sound, without sense or meaning; or whether there be not more meaning in it than Aristotle seems to have apprehended, is an inquiry which belongs more properly to the second part of my work, where I am to treat, not of the ideas of the human mind, but of the ideas of the *first* order; for it is only the ideas of the human mind that I am now concerned with, and those, I say, do exist

* *Τὰ γὰρ εἶδη αἰρετὰ, τριτισματα γὰρ εἶναι*, *Analytic. Posterior. lib. 1. cap. 22. p. 151. in fine*, Edit. Du-Val, where Philoponus, in his commentary upon the passage. fol. 53. tells us, that, by the word *τριτισματα*, we are to understand the flourish of those that played upon the *Cithara*, in order to try whether their strings were right tuned, before they began to play.

exist in the manner explained by Aristotle, that is, *in* the mind, and consequently have as *real* an existence as the mind itself.

To argue that, if no such ideas existed, there could be no truth, science, demonstration, or reasoning of any kind, will prove nothing to the sceptic, who doubts of every thing, and would make us believe that there is no such thing as *truth* or *certainty*. Neither would it convince those philosophers, who do not believe in God, to say, that, if the universe be the production of wisdom and counsel, not of chance and material necessity, there must necessarily exist ideas of the first kind, I mean the ideas in the Divine intellect; and, if it be true, that we have any participation of the Divine nature, there must also be in our minds some ideas resembling these. But I will argue from facts, that cannot be contraverted by the greatest sceptic and most confirmed unbeliever.

When a human artist executes any piece of work, has he not the *idea* of it in his mind before he executes it? This, I think, cannot be denied; and, if so, it is a clear proof that the first kind of ideas I mentioned is to be found even among us. Further, I ask, whether or not the idea of the artist is not *in* the work that he has executed? And, I think, this question must likewise be answered in the affirmative, as it is the idea of the artist that gives the thing its *form*, and makes it what it is; and, if so, we have likewise here the second kind of ideas I mentioned, which exists in the material substance. I ask further, Cannot we, by contemplating this piece of art, find out the idea of the artist, and so make it our own idea? If this neither cannot be denied, then have we likewise here an example of the third kind of ideas I mentioned, which, by us, are abstracted from material things, and made the objects of the mind's contemplation, separated from the *matter* in which they exist.

Let me further suppose, that this artist executes many works, some of the same kind, some of a different kind ; cannot I form a notion, not only of each particular work by itself, but of what they have in common, likewise of that in which they differ, and also of their several qualities and properties ?

Now, to apply this to the sovereign artist, the author of this universe, and of all the wonderful things in it ;—or, let me suppose that there is no artist in the case, no plan, no design, no previous idea of the work that was to be executed, but all the effect of chance or material necessity ; still I can find out the frame or constitution of the several productions of nature ; I can likewise discover what they have in common, and also wherein they differ from one another. Further, I can recognise in them certain qualities which are *peculiar* to some of them, and never are separated from them ; others, again, which are *accidental*, and may be in them, or not, just as it happens. And thus we have all those five classes of ideas, of which Porphyry treats *, viz. genus, species, difference, peculiar, and accidental.

The only doubt, therefore, that can possibly be, with respect to the existence of ideas in our mind, is, whether or not we have in fact the power of thus abstracting and generalizing ? or, in other words, whether we have the *faculty of intellect*, or only the faculties of sense and imagination ? for those who deny that we have ideas must necessarily maintain that we have no more intellect than the brutes, and only, like them, senses, imagination, and memory. Now, that we have the faculty of abstracting and generalizing, is a fact that, I think, I have made evident, by what I have said above †, where I have shown, that even our children possess this faculty, when they can operate upon that most abstract idea of *number*, without applying it to any particular thing. At the same time, I do not deny that it is very difficult in many cases, and a great work of science, to form a perfect idea of

* Porphyry's Introduction to Aristotle's *Categories*.

† See p. 324.

a thing, clear and distinct, separate from all other ideas, and without any thing material sticking to it ; and that, in exercising this highest faculty of the mind, we are much obstructed by the animal part of our nature, I mean, by the senses and imagination. But that we have the faculty, if not from nature, at least from use and experience, and that it may be greatly improved in the same way in which it is acquired, are facts that I hold to be uncontravertible.

In treating this argument, I have proceeded in a way that may be thought unnatural and preposterous ; for I have argued from art to nature, that is, from the effect to the cause, (all art being derived from nature), instead of arguing from nature to art, that is, from the cause to the effect. But this would have been supposing, what my adversaries in this argument are not willing to grant, that there is a Being, the author of this universe, in whose mind there are the ideas of every thing here existing. I have, therefore, chosen rather to argue from the works of art, concerning the existence of which there can be no dispute ; and to show that, if we have ideas of those works, we must, for the same reason, have ideas of the works of nature.

From the account here given of ideas, it is evident that the first order of them must be eternal and unchangeable, like the Being in whose intellect they reside ; and these may be understood to be what are called, in the language of Scripture, *the incorruptible things of God*. The second order, which exists *in the many*, that is, in material things, must of necessity, like them, be corruptible and perishing ; but, like them, they are constantly renewed, so that there is no blank or gap in nature. And, as to the ideas in our minds, as they are, in this state of our existence, acquired, so they are also lost by oblivion, and many other causes. But those who believe our minds to be eternal, and of divine original, will likewise believe, that neither is there here any gap in nature ; but that, as we had ideas before we came into this prison

son of flesh and blood, so we shall have them, likewise, after we are released from it, by some other method of communication with the great source of all ideas, viz. Nature, and its Divine Author *.

From this account of ideas, it is evident in what sense generals may be said to be, or not to be, *besides* particulars, which I find, from a passage of Aristotle †, was a puzzle in antient times. Considered, as Plato considers them, they are beings having a substance, and existing separately, not only from the corporeal things which participate of them, but from the mind which conceives them. On the other hand, according to Aristotle, considered as substances, they have no being at all, *besides* particulars. But, considered as in the mind of the Supreme Cause, they have an existence, and an existence more real than particulars, because they are eternal and unchangeable, as Aristotle has said, whereas particulars are corruptible and perishing ‡.

Neither

* The distinction that I have made here betwixt those ideas which are *incorruptible*, and those which are *corruptible*, will, I think, be sufficient to answer the puzzle that Philoponus makes upon this subject, in his commentary upon the first book of the *last Analytics*, fol. 61. where he endeavours to set Aristotle at variance with himself, because that he says in one place, (*Last Analytics*, lib. 1. cap. 24.) that generals are *incorruptible*, but particulars *corruptible*; whereas, in the beginning of his work *περί ψυχης*, he says, that generals are either nothing at all, or posterior to particulars. But this contradiction is only in appearance; for, in the first passage, he is speaking only of the first order of ideas, those in the Divine Mind, which are undoubtedly incorruptible; whereas, those existing in matter, are as certainly corruptible. But, in the book *περί ψυχης*, he is speaking of the ideas of the human mind, which, as they are formed from particular things, are undoubtedly, in order, posterior to them. And, as to the doubt that he states of ideas having any existence at all, it must be understood of such an existence as Plato gives them.

† *Analytic. Posterior.* lib. 1. cap. 24.

‡ Aristotle, *ibid.* His words are, Εἰ μὲν τις λόγος ἔστι, καὶ μὴ ὁμωνυμία τοῦ καθολοῦ, εἴη αὐτῷ οὐδὲν ἥττον εἶναι τῶν κατὰ μέρος ἀλλὰ καὶ πολλόν· ἐστὶν τὰ ἀφθάρτα, ἐν ἵκανοῖς ἐστί· τὰ δὲ κατὰ μέρος, φθάρτα πολλόν.

Neither have they a less real existence because they do not exist separately; for that is the case of qualities or accidents, such as black and white, round and square, which do not exist separately, but necessarily in substances, yet have a real existence as well as the substances. In like manner, ideas, though they exist only in particular substances, or in the mind of some intelligent being, have a real existence.

It makes, however, a difference, whether the idea exists only in our minds, or whether it does not likewise exist in particular and material things. If it exist only in the first manner, it is a mere notion, and what the schoolmen call an *ens rationis*, such as the idea of a Chimaera, or a Hippocentaur, or of any other animal that never existed. Whereas, if it exist not only in our mind, but in some material thing, or, in other words, if the idea be produced into act, then has it what may be properly called a *real* existence.

To conclude, the whole argument concerning the existence of ideas comes to this : Not only the philosopher, but every the most vulgar man, distinguishes, in the works of art, betwixt the *matter* and the *form*, observing, that the same matter takes various forms, according to the pleasure of the artist, and different matter the same form : He therefore thinks and speaks of the *form*, without taking into his consideration the *matter* of which it may be made ; and this form, even in common language, is called the *idea* of the thing. In like manner, the various natural substances, with which we are surrounded, have various shapes, texture, and conformation of parts, and other qualities and properties, which discriminate them one from another, and make every thing to be what it is, in contradistinction to every other thing. These constitute the *form* of such substances; and, when we have got a clear and distinct notion of this form, we are said to have an *idea* of the thing ; and this *idea*, likewise, we consider as distinct from the *matter*, of which we have no distinct notion at all, but only a confused apprehension ;

hension; so that it is truly only the idea of such things that we know.

Thus, I think, I have proved, that *ideas* or *generals* have a real existence; as well as the particular objects of sense. And I will proceed, in the next chapter, to solve some difficulties that may occur concerning the combination of ideas in propositions and syllogisms.

CHAP.

C H A P. XI.

The Foundation of all Syllogism, and, consequently, of all Reasoning, is, that one Idea contains another as a Part of it—This illustrated by Examples, and shown to apply to all Kinds of Syllogism—In what Sense one Idea can be said to contain another—The Genus contains the Species, and therefore is praedicated of it—As the Genus contains the Species, so the Species contains the Genus—The Reason why this Difficulty has not occurred to Modern Sceptics—It did occur to Plato, but is solved neither by him nor Aristotle—Solution of the Difficulty—Illustrations from Material Things, such as Seals and Statues—Illustration from Ideas in the Mind of an Artist—from the Intelligible Forms in the Mind of the Supreme Artist—Observations arising from this Theory—Primo, it appears how Generals are the Cause of Particulars—Secundo, It explains how the Genus contains many Specieses, but the Species only one Genus—Tertio, It explains the mysterious Language of Plato concerning Ideas—Lastly, It shows the Progress of Things upwards, and how all Things tend to one.

ALL demonstrative reasoning, and, indeed, all reasoning of every kind, supposes, not only the existence of generals, but that there is a subordination of them, one to another : Or, in other words, that one idea is more general than another ; and, that the less general idea is contained in, and makes a part of the more general. And, accordingly, the whole doctrine of the syllogism, to which all demon-

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frative reasoning, and, indeed, all reasoning of every kind, is reducible, depends upon this proposition, That, if one idea contains, or does not contain, the whole of another; and, if that other does contain, or does not, the whole of a third, then does the first contain, or not contain, the whole of the third; or, in other words, if one of the ideas is a part, or not a part of another, and, if a third idea is a part, or not a part of that idea which is a part of the first, then will the third idea be a part, or no part, of the first. But, as those things are not easily expressed by words, I will do, as Aristotle has done in his logical works, I will use letters, as general characters, to express them. The proposition, then, expressed in that manner, is this, That, if A contains the whole of B, and B contains the whole of C, then A contains the whole of C: Or, if A does not contain B, nor any part of it, or, what is the same thing, excludes B, and, if B contains the whole of C; then does A exclude C, and every part of it. And, to make the matter still clearer, I will do, as Aristotle's commentators do, and sometimes himself, apply these general characters to a particular example; as thus, If the general idea of *substance* contain the whole idea of *animal*, and if *animal* contain the whole idea of *man*, then will *substance* contain the whole idea of *man*. Or, to put it in the ordinary syllogistical form, Every animal is a substance; Every man is an animal: Therefore every man is a substance. And this is a syllogism of which the conclusion is affirmative. And, as for the negative conclusion, take this for an example: The idea of a *stone* does not contain, or, what is the same thing, excludes the whole idea of *animal*. The idea of *animal* contains, or includes the whole idea of *man*; therefore the idea of *stone* excludes the whole idea of *man*; which, in the syllogistical form, runs thus: No stone is an animal; Every man is an animal: Therefore no man is a stone.

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In all these instances, it is manifest, that the more general idea is considered as a *whole*, and the less general as a *part*; and upon this relation of the one to the other the conclusion of the argument altogether depends. And, accordingly, in this way Aristotle has explained the principle of syllogism *.

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* His way of expressing, that the more general idea contains the whole of the less general, is, that the former is *κατα παντος* of the latter. And the way he expresses the relation of the less general to the more general, is by saying, that the less general is *εν ολη* of the more general. The expressions, therefore, denote the same thing, only considered in different respects. His words are, Το δι εν ολη ειναι ιτιρον ιτιρον, και το κατα παντος κατηγορεσθαι θατιρον θατιρον, ταυτοι εστι. λεγομεν δι το κατα παντος κατηγορεσθαι, οταν μηδεν η του υποκειμενου λαβειν, καθ' ου θατιρον ου ληθησεται. *Analyt. Prior. cap. 1. in fine.* And, in the beginning of the 4th chapter thereafter, he expresses the relation of the three terms of the syllogism to one another in the following words: 'Οταν ου οροι τρεις ουτως εχουσιν προς αλληλους, ουτε τον ισχυατον εν ολη ειναι τω μισω, και τον μισον εν ολη τω πρωτη ειναι, η μη ειναι, ανωκη των ακρων ειναι συλλογισμοι τελειοι. And, in an after passage of the same book, he says expressly, that, if the one idea is not to the other as a *whole* is to a *part*, and, if that other is not to a *third* as a *part* to a *whole*, there is no syllogism: 'Ολως γαρ ο μη εστιν, ως ολον προς μέρος, και αλλο προς τουτο ως μέρος προς ολον, ες ουδενος των τριουτων δεικνυσιν ο δεικνυν' ουδε γαρ γινεται ο συλλογισμος. *Ibid. cap. 41.*

The only instances I have given of syllogisms are those whose conclusions are either universal affirmatives, or universal negatives, or, in Aristotle's language, that are either *κατα παντος*, or *κατα μηδενος*, because I would not embarrass the argument with syllogisms whose conclusions are either particular affirmatives, or particular negatives; that is, as Aristotle has expressed it, either *κατα τινος*, or *ου κατα τινος*, or, what is the same thing, *ου κατα παντος*. But the reason of the thing is the same with respect to these particular propositions, and with respect to the universal; because what is the rule for the whole, must also be the rule for the part. Thus, if A contain B wholly, and B contain a part of C; then will A contain a part of C; that is, the conclusion will be a particular affirmative. Again, if A exclude B wholly, and B includes a part of C, then will A exclude a part of C; where the conclusion is a particular negative, or *ου κατα παντος*. And, as all the conclusions of syllogism must of necessity be either affirmative or negative, and each of these either general or particular, we have here a short view of the whole doctrine of syllogism, which manifestly depends upon the principle of one idea containing, or not containing another, as a part of it.

But the question is, in what sense one idea can be said to be *part* of another? And this is a question of very great importance, as, without being able to answer it, we cannot give any rational account of the evidence of the syllogism, nor, indeed, of any other kind of reasoning, which, as I have said, is all reducible to syllogism.

One answer to this question is obvious enough, namely, that the more general idea, which contains the less general, as a part of it, is the genus; and the less general, so contained, is the species; for it is only, when ideas have that relation to one another, that the one can be said to contain the other as a part. This will be evident, if we consider that, when one idea thus contains another, it is always praedicated of that other. Thus, the idea of *animal*, which contains the idea of *man*, is praedicated of *man*, and we say, *Man* is an *animal* *. Now, as I had occasion to observe before †, one idea can be praedicated of another only in two respects, either as *genus* and *species*, or as *accident* and *substance*. Now, though the accident can be praedicated of the substance, it is only praedicated of it as inherent in it, not as containing it; or, as Aristotle expresses it, it is *ἢ ὑποκειμένου*, not *καθ' ὑποκειμένου*; for it is impossible that we can say, that the colour *white*, for example, which we praedicate of *man*, or any other animal, can be said to contain that animal. It remains, therefore, that it is only when the genus is praedicated of the species, that the one idea can be said to contain the other as a part of it.

But here the question recurs, In what sense the species can be said to be part of the genus? It is not, as one piece of matter is part of another,

* The genius of our language will not admit such propositions to be expressed in a more natural way, by putting the praedicate, which is the greater term, first, as in Greek, *ζῷον ἐστὶ ἡ ἀνθρωπος*; or, to express it in Aristotle's logical language, *ζῷον κατὰ τοῦ ἀνθρώπου*; by which any ambiguity that may arise from the use of the substantive verb *ἐστὶ* is removed.

† p. 383.

other, or one portion of space, or of time, is part of another, or as one number is part of another. Nor is it in the sense that we say that any quality inherent in a substance makes part of that substance; for, as I have said, this relation of ideas, by which they are considered as *whole* and *part*, has nothing to do with *substance* and *accident*. The question, therefore, appears to be of some difficulty. And the difficulty will appear the greater, if we consider that the genus not only contains the species, but the species also contains the genus: So that the genus may be said to be a part of the species, as well as the species of the genus*; for the species, *man*, undoubtedly contains the genus, *animal*, which is so essential a part of man, that we cannot conceive man to exist without it: And therefore it is made part of the definition of man. Now, how can we conceive that the same thing should be both *part* and *whole*, with respect to another thing? or, in other words, that one thing should both contain and be contained in the same thing? Here, therefore, the matter appears to be very much involved and perplexed; and we are at as great a loss as ever to know upon what foundation the evidence of the syllogism, and of every other kind of reasoning, rests.

This is an objection to the certainty of human reasoning, which has not occurred to any of our modern sceptics, for a reason that is plain enough, namely, that they are not so learned in logic as to see it. But it appears to have occurred to Plato, in the *Politicus**, where he says, 'That every species is a part, but every part is not a species.' But he adds, that a more particular explanation of this difference betwixt the two,

* This was very well known in the Peripatetic school; for they distinguished betwixt the genus or species that was *ἐν τοῖς πολλοῖς*, and that which was *ἐν τοῖς ἁπλοῖς*. The genus and species of the first kind is that which comprehends the specieses or individuals under it; whereas, what is *ἐν τοῖς πολλοῖς*, is what exists in the specieses or individuals, and makes a part of them. See what I have said above, concerning this distinction of ideas, p. 466.

† Page 532. Edit. Ficini.

two, would be a work of time and difficulty, and would carry him too far from the subject on hand. I wish, however, that, if not there, in some other place, he had explained this matter. But this he has not done, as far as I know. Neither has Aristotle done it in his Logic, where he has talked so much of one term of a proposition being a part of another, and has made it, as I have shown, the foundation of his whole system. I can assign no other reason for this omission, except the same which I assign for his giving no account, in his Ethics, of the *fair* and the *handsome*, which, however, he has made the principle of all virtuous actions, namely, that such inquiries belong to the first philosophy, not to particular sciences, such as logic or morals, which, like other subordinate sciences, assume their principles, and refer you to the *first* science, or science of sciences, for the demonstration and explanation of them. But, neither in his Metaphysics have I found any solution of this difficulty concerning the principle of his Logic; nor have any of his commentators, as far as I know, supplied this defect. We must, therefore, try what we can do, without their assistance, to solve it.

In the *first* place, it is impossible, by the nature of things, that the genus should contain the species as a part of it, and the species should likewise contain the genus, in the same respect. But, in different respects, it is possible that each of them may contain the other, and be contained by it. We must, therefore, try to distinguish the different manners of *containing*, and *being contained*. And there is a distinction that runs through the whole of antient philosophy, solving many difficulties that are otherwise insurmountable, and which, I hope, will likewise solve this difficulty. The distinction I mean is the distinction betwixt what exists *δυνάμει*, or *potentially* only, and that which exists *ἐντελέχεια*, or *actually*. In the first sense, every thing exists in its causes; and, in the other sense, nothing exists but what is actually produced. Now, in this first sense, the whole species exists in the genus; for the

genus

genus virtually contains the whole species, not only what actually exists of it, but what may exist of it in any future time. In the same manner, the lowest species, below which there is nothing but individuals, contains virtually all those individuals, present and future. Thus, the species *man*, comprehends all the individuals now existing, or that shall hereafter exist; which, therefore, are said to be parts of the species *man*. On the other hand, the genus is *actually* contained in the species; and the species, likewise, in each of the individuals under it. Thus, the genus animal is *actually* contained in the species man, without which it could not be conceived to exist. And, for the same reason, the species man is *actually* contained in each individual *.

I will endeavour to illustrate this doctrine of mine by some examples: And I will begin with one that is much used by the philosophers of the Alexandrian School, but for another purpose that I shall mention afterwards. The example is that of a figure upon a seal, which *virtually* contains all the impressions of that figure that are made, have been made, or shall be made; whereas each impression *actually* contains the figure of the seal but once. In like manner, the famous statue of the *Venus of Medicis* contains virtually in it all the many copies that have been made of it, or that shall hereafter be made of it in Paris plaster, or metal; whereas each of the copies contains only one Venus: And thus it is that the idea of man contains virtually Peter, James, and John; whereas, each of these contains actually but one man.

But.

* It is a piece of justice which I think I owe to an author, hardly known at all in the western parts of Europe, to acknowledge that I got the hint of the solution of this difficulty from him. The author I mean is a living Greek author, Eugenius Diaconus, at present Professor, as I am informed, in the Patriarch's University at Constantinople, who has written an excellent system of logic, in very good Attic Greek. See what I have further said of him in the *Origin and Progress of Language*, vol. 1. p. 45 2d edition.

But seals and statues, it may be said, are material things, and which, therefore, are not so fit to illustrate conceptions and ideas of the mind, which are immaterial. I will, therefore, in the next example I am to give, go a step beyond the material thing, and ascend to the idea of the artist who made the seal or the statue. In his idea, I say, was virtually contained, not only one statue which he should afterwards make, but twenty, or one hundred, if he should make as many from the same idea ; and not only these, but all the copies that should, at any after time, be made of his statue, by other artists. Whereas, every one, either of duplicates made by himself, or of copies made by others, would *actually* contain his idea but once.

But I will ascend a step higher, and a great step it is—from the *ideas* of a human artist, to the *intelligible forms* in the mind of the Sovereign Artist, which make what we call the *intellectual world*, the pattern and archetype of the *material*. And this brings us directly home to our subject ; for these *forms* in the mind of the Divinity are nothing else but the *genuses* and *specieses* of which we are speaking. Now, that in these *genuses* all the *specieses* are virtually contained, and, in the *specieses*, all the *individuals* of every kind, no body will deny who believes in God ; for it is in this sense, and this sense only, that *all things are in God* ; because it is impossible to imagine that they can be in him *actually* and *materially*. Suppose, therefore, the material world not to have been from all eternity, but that time was when it was not, even then it existed *virtually* and *potentially* in the ideas of the Divine Mind. But, when these ideas are exerted into act, and the *forms* impressed, as it were, upon *matter*, then such material thing contains this form *really* and *actually*. And it was to illustrate this production of the visible world from the intellectual, that the Alexandrian philosophers used the comparison of the seal. But I use it for another purpose, namely, to show that the figure upon the seal may be multiplied *in infinitum*, by impressions of it upon wax, and yet

excellent, and is *demonstration* properly so called, by which we prove, not only that a thing *is*, but *why* it is, and by which we come as near as we can to superior intelligences, who see things in their causes, and, through the generals, recognise the particulars.

Secundo, We may also see here the reason why the genus can contain so many specieses, differing all, in some respects, each from the other, yet all united in one common genus; whereas, the species contains but one genus, to which it belongs. And, for the same reason, the individuals of every species contain only each the species to which it belongs*: For the same thing may contain many things *potentially*, as many as can be produced out of it; but nothing *actually* existing can contain any thing but that which is *actually* in it, and constitutes its nature and essence.

And here we may perceive the reason why an universal affirmative proposition does not reciprocate; for, though I can praedicate the genus *animal* of the whole species *man*, and all the individuals under it, I cannot praedicate *man* of the whole genus *animal*, and all the specieses and individuals under it, because *man* contains nothing more but the genus *animal*, so far as it exists in him, not as it exists in other animals; for that would be to make one species of animals, or one individual of that species, many specieses, or many individuals. The proposition, therefore, into which the universal affirmative above mentioned is convertible, is, that *man* may be praedicated of *some animal*†.

Tertio,

* It may be objected, that the individual *man* contains, not only the species *man*, but the genus *animal*, and, above it, the genus *animated body*; then an higher genus still, *body*; and, lastly, the highest of all, *substance*. But it is to be observed, that the individual *man*, in *actually* containing the species *man*, does also *actually* contain all the several genres above it, the species, as I have shown, *actually* containing the genus above it.

† This is the distinction made by Aristotle, betwixt the universal affirmative, and the particular affirmative, which, as I have observed, he expresses thus, *κατα παντος*, and *κατα τινος*; so that, though we can say *ζωον κατα παντος ανθρωπου*, we cannot say *ανθρωπος κατα παντος ζωου*, but only *ανθρωπος κατα τινος ζωου*.

Tertio, From this theory of genus and species, I think we may explain the mysterious language in which Plato speaks of ideas, without adopting his system of ideas. An idea, he tells us, is, ‘ That which makes *one* of the *many* ; which, preserving the *unity* and *integrity* of its own nature, runs through and mixes with things *infinite* in number ; and yet, however *multiform* it may appear, is always *the same* ; so that, by it, we find out and discriminate the thing, whatever different shape it may assume, and under whatever disguise it may, ‘ *Proteus-like*, hide itself * ;’ for, according to the account that I have given of the matter, it is evident, that the visible forms, which are derived from the intelligible form, must be *many*, and likewise *one*, in respect of the original form, which, like the signature of the seal, they have all impressed upon them. Further, that this form, when it is produced into act, must necessarily run through, and mix with an infinite number of things, the original form still remaining one and the same, without addition, diminution, or alteration of any kind. And, lastly, it is no doubt true, that this form, by being mixed and incorporated with matter, is very often obscured and hid ; so that it is very difficult to find it out separated from the matter, and discriminated from other forms with which it may be mixed. Neither is it difficult, I think, from the principles I have laid down, to clear up that puzzle, which Aristotle objects to the doctrine of ideas, both of Plato, and of the Pythagoreans ; the former of which said, that all things were what they were by *participation* of the idea, the latter by *imitation* † ; for both were in the right, and expressed the same thing only by different words ; for the material thing is truly an imitation of the ideal form, and, as it has that form upon it, may also be properly enough said to participate of it.

P p p 2

Lastly,

* See Plato in *Philebo*, et *alibi*.

† *Metaphys.* lib. 1. cap. 6. p. 848. *Editio Du Val*.

Lastly, From what I have said of the subordination of ideas, we may observe the progress of things upwards, and the wonderful tendency of all things in nature towards one principle of union. This is to be found in all the several classes of being, which still rise, one above another, till they end in that one category to which they belong. And here the analysis of logic ends; but where logic ends, *theology* begins, and shows that all the ten categories terminate in one principle, and have one common origin, the *intellect Divine*, the source of every thing existing, or that can exist in the universe, where all things exist in the most perfect *unity*; for there is not *first* or *last* there, nor the succession of ideas as in our minds, but all things are present at once; and the *past*, the *present*, and the *future*, what is *precedent*, and what is *consequent*, are seen in one view. In this manner, not only logic, but every other science, ends in *theology*, the summit of all philosophy, and which to know, is the perfection of human nature.

Having thus removed, as I hope, all objections to the principles of human knowledge, I will now proceed to some further speculations concerning *mind*, with which I am to conclude this book, and this part of my work.

C H A P.

C H A P. XII.

Of Propositions, the Subject of which is a particular Mind.—Mind particular is the Subject of Intellect—therefore may be the Subject of Demonstration—Instances of Demonstration concerning Mind—The Existence of that great Mind, which is the Cause of all Things, is demonstrable—There we are to seek for the Origin of Truth, not in the Mind of Man, nor in the Material World—It is from God that Truth derives its Eternity and Immutability—Truth would not be eternal and immutable, if the Opinion of Des Cartes were true—God is the Fountain of Beauty as well as of Truth—The Difference betwixt Beauty and Truth—The Intellectual World, the perfect Model of all Beauty in Theory—Beauty in Practice Something more perfect still—The Universe, therefore, most perfectly beautiful—How far Man can advance in Beauty, either Speculative or Practical—To reduce our Ideas of Beauty to Practice, and make a little World of them, is the greatest Effort of Human intellect—The Materials out of which Man makes these little Worlds—His own Species the noblest of these Materials—Other Materials of this Creation—such as Sounds—Colours—Stone—and Metal—The Gift of Genius bestowed but upon few—Whole nations appear to want it altogether—One Nation had it in the most eminent Degree.

ALTHOUGH I have said a great deal of *mind*, the reader will forgive me for concluding this book with another chapter upon it, since I could not otherwise finish my doctrine of propositions, which, he will recollect, I divided into two kinds*:—Those of which both
 praedicate

* See page 378—410

praedicate and subject were generals ; and those of which the praedicate was a general, but the subject a particular thing. These, again, I subdivided into such whose subject was a particular *corporeal* thing, and such whose subject was a particular *mind*. Of all the other kinds of propositions I have already spoken. And it only remains that I should say something of the last kind.

Every particular body is the object of sense, and of sense only; and, for that reason, and on account of its perishable nature, it never can be the subject of science. Mind, on the other hand, whether general or particular, is the object only of intellect; for it cannot be apprehended by sense, nor otherwise conceived but by intellect. And as it is, of its nature, eternal and incorruptible, there is nothing to hinder even a particular mind to be the subject of science and demonstration. And though we do not perfectly know the substance or essence of mind, any more than of body, yet, knowing perfectly some essential properties of it, we can, from thence, by strict demonstration, deduce others. Thus, for example, we know that *activity* is of the essence of mind; from which we have already seen, that many important consequences follow, and many more will be deduced from it, when we come to treat of God and Nature.

Again, mind is, by its nature, immaterial: What is immaterial has no parts: And what has no parts cannot be moved. This is a proposition that I have taken for granted in the preceding part of this work; but, if any body should doubt of it, it may be thus easily demonstrated from the nature of motion: What is moved has its parts successively in different parts of space: What, therefore, has no parts, cannot be moved. And thus we conclude, as Aristotle does, that no particular mind, such as the human, can be moved directly, immediately, or of itself, and by its own nature, but by *accident*, that is, by its happening to be conjoined with another substance by its nature moveable, viz. body, along with which it is therefore moved.

It

It is from the nature of mind, so different from body, joined with the existence of the material world, which, I think, I have sufficiently proved, against all the cavils of those who pretend to disbelieve it, that we conclude there is a God, self-originated, necessarily existent, and the author of all other things existing in the universe. This, I trust, I shall be able most clearly to demonstrate in the proper place. But, taking it at present for granted, I proceed to show, that truth and science are to be deduced from a much higher origin than the human mind, even from God himself. And, in this way, I think I shall properly conclude what I have said upon the excellence and stability of truth and science, to which otherwise, it appears, that something would be wanting.

For, if truth were nowhere else to be found, but in a mind such as ours, connected so intimately with body, and from thence liable to so many disorders and perturbations, and to oblivion among other things, it might justly be doubted, whether truth deserved the epithets that are bestowed upon it, of *eternal* and *immutable*. Besides, as there can be no truth without generals, and as all we know of truth is from the material world, where those generals or specieses of things are immersed in matter, and in continual motion and agitation with matter, the curious and philosophic mind will naturally inquire whence those specieses or forms of things come, and whether they are not to be found somewhere in a more fixed and permanent state. And, if he be not a follower of that *mad* philosophy, which believes that nothing exists in the universe besides matter, he will immediately perceive, that those forms could not have originated from matter. This will lead him to seek for their origin elsewhere. And, as there is nothing in the universe but matter and mind, they must therefore proceed from mind, and mind intelligent. Thus he ascends from the material to the intellectual world, which must as certainly exist as the material, if it be true that this universe is not the work of blind chance, or of material necessity,

necessity, but of counsel and design. Now, this intellectual world, comprehending such infinite variety of forms, all united together in one amazing system, can be nowhere else but in the mind of the Deity*.

Here we may see with what propriety God is called in Scripture *the God of Truth*; for in him are all ideas or specieses of things, with all their connections, dependencies, and relations to one another. These, by a wonderful proceſſion, of which we can have no idea, are produced into act, and become the material or viſible world, which is no other than a tranſcript of the Divine Mind, ſuch as is legible even by us poor mortals; for it is from thence that we firſt derive our ideas, recognizing the ſeveral forms and ſpecieses of things, and inveſtigating their ſeveral connections, dependencies, and relations, with much labour and agitation of mind—from thence, by the help of this firſt philoſophy, of which I treat, we aſcend to the fountain of all truth, and all ſcience, and diſcover there that tranſcendant truth which I mentioned in the beginning of this book †, and which alone can give

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* This intellectual world may be conſidered as poetically deſcribed in the following beautiful lines of Homer, ſo well tranſlated by Lucretius, that it is not eaſy to ſay, whether the tranſlation or original be moſt beautiful. The paſſage in Homer is,

‘Ἡ μιν’ αἶψ’ ὥς ἱπποῦσ’ ἀπίβη γλαυκῶπις Ἀθήνη
 Οὐλομένηνδ’, ὅθι φασὶ θίων ἶδος ἀσφαλὶς αἶη
 Ἐμμένει· οὐτ’ ἀνιμῶσι τινάσσεται, οὐτε ποτ’ ὀμβρῇ
 Διυέται, οὐτε χιὼν ἐπιπίληκται· ἀλλὰ μάλ’ αἰθερῇ
 Πιπτάται ἀνιφιλος, λίσκη δ’ ἐπιδίδρομιν αἶγλη.

Odyſ. 6. v. 41.

The words of Lucretius are,

Apparet divum numen, fedesque quietae;
 Quas neque conſcutiunt venti, neque nubila nimbis
 Adſpergunt; neque nix acri concreta pruina
 Cana cadens violat; ſemperque innubilis aether
 Integit, et large diſfuſa lumine ridet.

Lib. 3. v. 18.

In this manner thoſe poets may be underſtood to have contraſted the ſtillneſs and tranquillity of the intellectual world, with the conſtant motion and agitation, the never-ceaſing round of generation and corruption of the material world.

† Page 374.

to truth that *eternity* and *immutability* which is so much talked of, but so little understood ; for, as I observed a little before, if no other being had any perception of truth, except man, and if there were no other pattern or archetype of it but this material world, in constant motion and change, it might indeed be said to be something *real*, and not merely ideal or notional ; but it could not, I think, be said, with much propriety, to be eternal and immutable.

Nor could it, I think, deserve these epithets, if what Des Cartes, and some other French philosophers, who pretend to be Theists, have said, were true, that truth and falsehood are, by their nature, arbitrary, depending altogether upon the will of the Deity, so that it was in his power to have made truth falsehood, or falsehood truth. But they might as well have maintained, that it was in the power of the Deity to change his nature, and be other than what he is, a self-existent Being, necessarily existing, and, in every respect, unchangeable, ‘ without change, or shadow of change ;’ for these ideas of his mind, from which all truth is derived, are part of his nature and essence, and therefore unchangeable.

But, is not *beauty* something different from *truth* ? and is not God the fountain of the one as well as the other ?—And first, as to the difference betwixt *truth* and *beauty*, there is *truth* in a single proposition, but no *beauty* ; for, in order to give *beauty* to *truth*, there must be a combination of propositions mutually connected and dependent one upon the other. In short, there must be a system, of which the mind perceiving the union, is, at the same time, struck with that most agreeable of all perceptions, which we call *beauty*. And the greater variety there is in this system, the greater the number of parts, and the more various their connections and dependencies upon one another, the greater the beauty, provided the mind can distinctly comprehend the whole, and the several parts, in one united view.

Of this kind of beauty, the first and the greatest that it is possible to conceive, and which, of necessity, must be the archetype and model of all beauty, is the intellectual world above mentioned, where there is such infinite variety, and, at the same time, such wonderful order and regularity, that it is impossible for human intellect to have any more than a very rude and imperfect idea of it.

Here, then, we have the utmost limit of *theoretical* beauty, or beauty in contemplation. But there is a beauty still higher, and more perfect, and which is at the very top of the pyramid. It may be called *practical* beauty, because it produces into act the *ideal* beauty, and gives it life and energy. It is what we conceive gives the highest perfection even to God himself, and crowns all his other attributes; for, if the intellectual world had never been produced into act, and the Deity had contented himself with the mere contemplation of it, through all the ages of eternity, we should have conceived something defective in power and goodness, and even the ideal beauty of the intellectual world we should not have considered as complete; but, when all these wonderful ideas are realized, when every thing is produced into life and being, and when God Almighty has pronounced that they are all *good*, and 'answering his fair idea,' as our poet expresses it, then are *power*, *goodness*, and *beauty*, complete.

What remains to be considered is, how far man can advance towards this perfection of power, goodness, and beauty, both theoretical and practical. That he must be forever greatly defective in power and goodness, is evident; nor is it possible that he can comprehend in his mind such theoretical beauty as that of the intellectual world; far less can he put it into execution. However, as to beauty in theory, there is no man, I believe, who has attained to the use of intellect, that has not some idea of it. But, where the intellect is imperfect, there the

the idea of beauty will also be imperfect ; and it is only the most perfect intellects that can comprehend any great plan of beauty.

But what shall we say as to the production of such a plan into act and execution ? This, so far as it can be performed by man, is the highest perfection of his nature, and that in which he comes the nearest to Divinity ; for, by the imitation of Divinity, he produces a little world out of the ideas of his mind. It is this creative faculty which is denoted by the word *genius*, being that which, every body allows, distinguishes one man from another more than any thing else.

But, out of what materials is this little *creator* to make those beautiful works ?—And here we may perceive how much his power is limited, compared with that of the great Creator ; yet he has some materials ; and the nobler the materials upon which he works, the nobler and more beautiful the workmanship.

His first and best materials are himself, and the rest of his species—the noblest of animals undoubtedly here below. These, if he can mould and fashion into a system of polity, imitating, as far as possible, the great system of the universe, it is the noblest, the most beautiful, and most useful creation, that can be made by man, and that in which he comes nearest to the great Creator. The rest of the animal race is already, by wisdom far superior to that of man, formed into systems of wonderful beauty. And, though man, by the care and culture he has bestowed upon those animals, has made them subservient to his purposes, and exceedingly useful to him, he has been very far from improving their nature and instincts ; but, on the contrary, has depraved all of them that he has meddled with, more or less : And the same may be said of the vegetable life.

There remain, therefore, only, for the subject of his art, besides his own species, things inanimate, such as *sounds, colours, stone, and wood*. Of these he makes wonderful works; the beauty of which chiefly consists in the expression of that which is noblest in nature, *mind*, without which there can be no true grace or real beauty in the works of art.

The first and noblest of these inanimate materials, is *sound*; which, considered as a subject of art, is divided into articulate sound, or language, and musical sound. The first of these is the direct and immediate expression of intellect, sentiment, and passion; and therefore it furnishes the materials of the highest art, next to that which I have already mentioned. This art is well known by the name of *poetry*. And the works of it may be of great extent, as well as great beauty and variety; for the subject of it is *man*, engaged in various pursuits and scenes of action, but which must all have an union fit to constitute a *whole*, consisting of parts variously dependent upon, and connected with each other.

Musical sounds, that is, sounds, the ratio of which to one another, in respect to acuteness and gravity, we can measure, are the materials of which the musical art is made; an art which, though it do not express ideas, as words do, affords a language of sentiment and passion, more expressive than the language of words. Where passions, therefore, are to be excited, and the sentiments and manners of men formed without reason or philosophy, which must be the case with regard to very young men, and the vulgar of all ages, there is no art so useful, and which can be so much employed for the general benefit of all mankind,

Colours are the materials of the finest art of illusion that ever was invented, I mean *painting*, which speaks to the eyes in the most forcible

cible and agreeable manner. But it is inferior both to poetry and music, in this respect, that there is no succession in it, but it represents its objects all at once; so that a piece of painting cannot be of any great extent or comprehension, otherwise the eye could not take it all in, nor could the mind perceive a *whole* in it.

Of the two last arts I shall mention, the materials are more solid; for they are stone, metal, or timber, upon which *sculpture* operates in statues, alto, or basso-relievos, and *architecture* in elegant and stately buildings, both arts of great beauty; and the latter, likewise, of great utility; but they are confined, like painting, to objects represented all together, and without succession; and therefore are not capable of the same extent and comprehension as poetry and music.

The works of these fine arts are really *creations*, by which man imitates the highest perfection of the Divine Nature, and endeavours to produce a little world, resembling the beauty of the great world of God. As the great gifts of nature are bestowed very sparingly, and but upon very few, it is impossible that, in any nation, there can be many who excel in this greatest perfection of the human mind, *genius*. Nay, there appear to be whole nations, who have not at all, in any degree worth observing, this creative power of genius. Of this kind, is the great nation of the Chinese, who, though they excel in all mechanic arts, many of which they seem to have invented; and, tho' they have, or, at least, had the most exact internal police that I believe any nation ever had; yet, in the fine arts, they have made no progress at all, wanting, as it would seem, those ideas of the *beautiful* and *sublime*, which naturally lead men to express them in the different ways I have mentioned. Their statuary, therefore, and sculpture are without grace or beauty; nor is their architecture of any value. Their paintings, and their music, have no expression of any thing that is beautiful or sublime; and, in their poetry, which, I believe, is all of the dramatical kind, they show that they have not so much as the
idea

idea of a whole, and its dependent parts, without which, as I have observed, there can be no beauty *.

On the other hand, the Greek nation appears to have been the nation of the greatest genius that ever existed ; infomuch, that the fine arts may be said to be wholly theirs. For, though from other countries, and particularly from Egypt, they learned the mechanic arts, sciences, government, religion, and police, it is evident to me that the fine arts were all of their own growth. For, though the Egyptians practised music, painting, and sculpture, it was but in a low degree, without that grace and beauty which can intitle them to the appellation of *fine arts*.

It appears, therefore, that in our species, as in other specieses of animals, the excellency of it is confined to certain races of the animal, in certain countries of the earth, not diffused over the whole species. And it is only by imitating those men, whom heaven has thought proper, in this manner, to select from the rest of the species, that other men can attain, in any great degree, to this highest perfection of human nature.

And here I conclude this part of my work, in which I exhibit a face of nature quite different from that which is presented by

* The Chinese have that faculty, which nature appears to have bestowed universally upon the whole species, I mean the faculty of *imitation* ; for, in their paintings, they imitate nature very exactly. But they have no notion of what the French call *la belle nature*, by which we are to understand that *ideal* beauty which gives the perfection to all the productions of the fine arts. We should imagine that we saw in their paintings a taste for the wild and the grotesque, and a variety of scenery and landscape, that appears to us wonderful. But travellers tell us, that these are landscapes really to be seen in their country. And, particularly, those houses that we see niched in rocks, often very high, with steep winding paths up to them, Mr Bell, in his travels through Tartary into China, tells us, are very frequently seen in the mountainous parts of their country.

by the author of the *Essays*. According to him, every thing in the universe is carried on, either by material necessity, (for he says, and says rightly, that there is no chance in nature), or, which appears to be his system, by a wicked being, the author of all turpitude and moral evil. And it is this that distinguishes his philosophy, as I have observed, from all other philosophy, antient or modern ; for, though there have been other philosophers before him, who were Atheists, he is the only one who ever professed to believe that there was a devil, but no God * :—In the human mind, says this philosopher, there are nothing but *sensations* more or less lively, but no *ideas*, and, by consequence, no science or certainty, but every thing must appear to every man as it affects his senses :—Even our sensations are no better than mere delusion, and an empty dream, as there is no material world, and, therefore, nothing that can make any impression upon our senses :—And, *lastly*, we ourselves are nothing but a bundle of perceptions, that is, an accident without a substance. On the other hand, my system is, that there is *mind* in the universe, as well as *body*, and that what is called *nature* consists of *mind* and *body*.—That there is a Supreme Mind, the author of Nature, and which governs and directs her operations.—That this Mind is immaterial, and entirely separated from all matter, unchangeable, both in its essence and energies, infinitely powerful, wise, and good, the fountain of all truth, order, regularity, and beauty, in the universe.—That, below this Supreme Mind, and in infinite degrees of subordination, there are other minds, which move the several parts of this stupenduous frame, and accomplish certain ends, by the best means that infinite wisdom can devise.—That some of these minds have intelligence and consciousness of the ends for which they act : And, among these, is the human mind ; which, as it is connected with body, has sensations ; but, as
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* See what I have further said concerning this extraordinary system, p. 308.

it is intelligent, has likewise ideas, and, by consequence, the perception of truth, and of order, regularity, and beauty, derived immediately from the material world which exists around it, and upon which the Divinity has impressed the signature of intelligence, goodness, and beauty, and has, as it were, transcribed himself.

This was antient philosophy—This was the *wisdom of the Egyptians**, brought by Pythagoras into Greece and Italy, cultivated in the schools of Plato and Aristotle, and, in their writings, delivered down to us. To revive the study of these writings, and, with that study, the system of genuine theism, is the design of this work—a design that, I am persuaded, will be approved of by the wise and good, however much it may be disliked by the disciples of that wretched, impious philosophy which has become fashionable of late, and which is built upon no other foundation than the total ignorance of the Greek philosophy, and even of the language of it; for, in proportion as the Greek language has been more or less cultivated in the several parts of Europe, the Atheistical philosophy has more or less prevailed. On the continent, where the Greek tongue is very near quite forgot, it is almost universal. In England, where the Greek language is still studied, it is very much less prevalent. And here, in Scotland, I have observed that, as classical learning declines, the philosophy of Mr David Hume gains ground.

* Acts of the Apostles, chap. 7. verse 22.

F I N I S.

A P P E N D I X.

DISSERTATION ON the PRINCIPLES of the NEWTONIAN PHILOSOPHY.

C H A P. I.

An Inquiry into the Principles of the Newtonian Philosophy belongs to this Work—The Question concerning the Motion of the Celestial Bodies of great Importance with respect to Natural Religion, and the Doctrine of Theism—This Doctrine consists of two Parts—The Philosophy of Des Cartes repugnant to the better Part of Theism—The Philosophy of Sir Isaac Newton not so Material and Mechanical as that of Des Cartes—The Principles of it, however, ought to be carefully examined, as tending to the Disbelief of the Providence of God in the greatest Part of the Visible World—The Account of the Motion of the Celestial Bodies given by Sir Isaac—Their Motion composed of the two Motions of Projection and Gravitation—One of these two Motions Mechanical—Sir Isaac's Philosophy in his Principia incompleat, as it accounts only for one of these two Motions—Sir Isaac in vain endeavoured to supply this Defect afterwards—All the Causes of Gravitation that can possibly be assigned—The last Cause mentioned, viz. the constant Agency of Mind, the true Cause—This adopted by the Newtonians at present, and a great Improvement of Sir Isaac's System—But a farther Amendment is necessary.

AFTER reading over the Nineteenth Chapter of the Second Book of the preceding volume, concerning the Newtonian Philosophy, and conversing and corresponding upon the subject with some friends very much more learned than I in that philosophy, I have thought proper, by way of Appendix to this part of my work, to subjoin a Dissertation upon the same subject, in which I propose to say nothing concerning the geometrical, mechanical, and astronomical principles of the Newtonian system, these having been already sufficiently examined by others more capable to judge of them, but to in-

quire into the metaphysical principles upon which it is founded : For, as the principles of all sciences are contained in this first philosophy, which is therefore called the science of sciences ; and as, accordingly, I have endeavoured, in this work, to explain the principles of geometry and arithmetic, it belongs, I think, to my subject, to inquire whether a philosophy, which, at present, is so fashionable, agrees with the principles of this first philosophy ; an inquiry which, as far as I know, has not been made with any accuracy.

The question treated of in the chapter above mentioned, is, Whether the celestial bodies are moved by the immediate operation, and constant agency of Mind, according to the opinion of the antient philosophers ? or Whether, as the Newtonians maintain, the heavens are a machine, which God Almighty has indeed contrived, framed, and set a-going, but which goes on of itself, without his interposition, or that of any other Mind, by the operation of causes merely material and mechanical ? This is a question of great importance to the religion of Nature and the doctrine of Theism, which consists of two parts. The *first* teaches us, that Mind is the eldest of things, and that there is a Supreme Mind, which is the first Cause and Author of this universe ; the *second*, That the universe is not only the production of this Supreme Mind, but that it is governed and carried on by this Mind, or Minds subordinate to him, and employed by him as his ministers. And it is in this sense that the Deity may be said to be every where present, informing and animating every part of Nature, guiding and directing the whole : Nor do I know that the *infinity* and *ubiquity* of God can be any way better explained. Of these two parts of theism, this last, which asserts the providence of God over all his works, is, in my apprehension, the better half of religion, both natural and revealed ; for, I do not think that any man can be said to be truly religious, who has not a sense of a *present Deity* in the works of Nature, as well as the affairs of men.

A philosopher, therefore, such as Des Cartes, who assigns to Deity no other part, except, at first, to turn round a vortex or whirlpool of matter,

matter, from which, according to certain general laws of matter and motion, proceeds all this wonderful frame of things; not only the celestial bodies, and their movements, but the organization and successive generation of animals and plants; and who maintains that all this is not only originally produced, but is preserved and carried on without the guidance of any Mind; and who makes the brute-animals to be no more than machines, and ascribes all the various operations of their instinct to causes merely material and mechanical.—Such a philosopher I hold to be very little better than a downright Atheist, differing only from the mere materialist in this, that he has recourse to Deity in order to account for the origin of motion, without which, every system of materialism must be essentially defective. Nor is it to be wondered that, when Des Cartes had gone so far, his successors, the present French philosophers, should go one step farther, and endeavour to frame a world out of mere matter and mechanism, without giving the Deity even the trouble to begin the motion: And some of them, we know, have gone so far as to make a machine of the human mind, as well as of the brute *. And, indeed, it appears to me impossible, that a man who believes that all the appetites and inclinations of the brutes, so wonderfully suited to the preservation of the individual, and the continuance of the kind, all their operations, in consequence of those appetites and inclinations, and even their reasonings, (for that they have a reason of a certain kind, I have elsewhere shown †), to be mere clock-work, can think otherwise of the human mind.

As to the philosophy of Sir Isaac Newton, it is not, as I have observed ‡, universal, but is confined to the heavens, and the movements of the celestial bodies. He does not, therefore, meddle with the organization or generation of plants or animals; nor do I believe he thought that these could be accounted for by matter and mechanism. Neither does he say any thing of the minds of animals, and their operations, except what I wish he had not said, that a subtile spirit was the cause

R r r 2 of

* Abbé Prade, l'homme machine.

† Page 101.

‡ Page 205.

of sensation and spontaneous motion *. But of the heavens, I think, it is evident, he makes a machine, of which, indeed, he says the Deity is the contriver and fabricator, and the mover, too, if not *immediately*, at least *mediately*, being ultimately the Author of all motion in the universe : But the celestial bodies, being once set a-going, go on, he says, of themselves, mechanically, without the interposition of Deity, except upon some extraordinary occasions, when, for certain reasons that he mentions, the machine may need the mending hand of the Creator. With respect, therefore, to the great operations of Nature, and by far the greater part of the visible world, there is no Divine Providence, according to Sir Isaac, constantly operating ; and the Deity is as much out of the universe as the Gods of Epicurus, whom that philosopher has placed in certain *extra-mundane* spaces, out of the hurry and bustle of his worlds. A philosophy of this kind is, at least, a step towards the disbelief of what I call the better part of Theism, the Providence of God ; and, if it be extended further, and brought down from the skies to this our earth, (and I see no good reason why it should not), it puts an end to it altogether. It therefore behoves not only every good Christian, but every believer in the religion of Nature, to examine very scrupulously the principles of a philosophy which lead to such consequences.

Sir Isaac's machine of the heavens, and which is exceedingly well represented by the machine called an Orrery, is moved by two several powers : The one is called the *projectile force*, which is an impulse, such as that by which one body impels another, and by which, therefore, the planet is necessarily moved in a straight line : The other is called *attraction*, or, as I would rather chuse to call it, *gravitation*, by which the planet is impelled towards its center ; and, from these two forces combined, results that motion in an ellipsis, by which the planet is carried round its center ; and, as the projectile force, once impressed, continues for ever, and, as the motion towards the center, or centripetal force, as it is called, is every instant renewed, this elliptical motion,

* *In fine Principiorum.* See page 275. of this volume.

motion, though it may be disturbed by certain causes, which Sir Isaac mentions, never can cease altogether.

As to the origin of these two motions ; the projectile motion, Sir Isaac says, was impressed upon the body at some particular time, when this our system had a beginning. As to gravitation ; Sir Isaac, in his *Principia*, does not pretend to assign the cause of it, as he tells us in the conclusion of that work ; he only says, negatively, that he does not affirm it to be essential to matter ; but, as to the manner of its operating, it is evident that he understood it to operate by impulses incessantly repeated : And in this way he accounts for its force increasing as the distance from the center decreases. There is, therefore, according to Sir Isaac, this difference betwixt the projectile impulse and gravitation, that the one is but single, and needs not be repeated, the motion produced by it being one motion originally impressed upon body, and which continues for ever ; whereas the motion of gravitation is continually accelerated by incessant pulsations.

From this account of the Newtonian philosophy, which, I hope, every reader will think a fair and a candid one, it is evident that Sir Isaac has made a machine, as I have said, of the heavens, having given to the celestial bodies a motion that is mechanical ; for I call *mechanical* every motion that goes on of itself, without the immediate and direct application of the moving power, which, according to my philosophy, is Mind, operating either immediately, or by the intervention of other bodies. When it operates in the latter way, and when the motion is communicated from body to body, that motion is commonly called *mechanical* ; but, when the body, once put in motion, continues to be moved of itself, without the immediate operation of Mind, though it do not communicate its motion, I call that motion likewise *mechanical*, to distinguish it from motion produced immediately by Mind*.

Of

* See what I have said of the difference betwixt a machine and the moving Power, page 190.

The

Of this machine of the heavens, therefore, the two great motions, according to Sir Isaac, are, as I have said, the projectile motion and gravitation. But what are the moving powers which produce these motions? And it is evident, from the principles laid down in the *Principia*, as shall be afterwards shown, that Sir Isaac supposes both to be produced by bodily impulse, with this difference, only, that the first is produced by a single impulse, the other by repeated impulses: And this is all we can learn of the moving power of this machine from the *Principia*, where he does not so much as tell us of what kind the body is which impells the planet, either in the line of projection, or towards the center. The machinery, therefore, of the heavens, as explained by him in that work, is certainly very imperfect, as any account of a machine must

The matter, I think, may be distinctly and scientifically conceived in this way. When any body is moved, there must necessarily be a moving power, as nothing can be produced without a cause. This moving power, according to my philosophy, is Mind, of whose nature and essence it is *to move*, as much as it is of the nature and essence of Body *to be moved*. Now, Mind moves Body, either directly and immediately, or it does not. If in the former way, I say the motion is not material or mechanical, but immaterial, the mover being an immaterial power, and acting immediately and directly: If in the other way, the motion is by the intervention of other bodies, and is commonly communicated from Body to Body; and this motion I call *material* and *mechanical*. Of this kind are all the machines of human construction, because all those machines are ultimately moved by Mind, according to my philosophy, whatever name we may give to the moving power, calling it Air, Water, Fire, Weights, or Springs; and of the same kind are the machines of Nature's workmanship, such as animal bodies, which are moved immediately by muscles, sinews, and bones, but ultimately by Mind. To these two kinds of motion, Sir Isaac has been pleased to add a third, which goes on, not only without the direct and immediate agency of Mind, but without any agency at all of Mind, or of any other power except the matter itself. This is Sir Isaac's projectile motion of the planets. Whether there be any such thing in Nature as Body moved in this way, by its own power, or by a *vis insita*, as the Newtonians speak, I shall afterwards inquire; but, in the mean time, supposing it to be so moved, I call that motion likewise *material* and *mechanical*; for, though the motion be not communicated from Body to Body, as in the case of machines commonly so called, I do not know by what other name to call it, in contradistinction to motion produced immediately and directly by Mind.

must needs be, which does not mention the moving power. This defect in his system he has never supplied with respect to the projectile motion. His followers, indeed, say, that the projection of the planets is the immediate operation of Deity ; but this Sir Isaac has nowhere said ; though, I am persuaded, he believed that the Deity was mediately, or by the intervention of other bodies, the cause of the projectile motion, as well as of every other motion in the universe. And, indeed, as he says that both the projectile motion and gravitation are produced by an impulse, or impressed force, as he calls it, in the same manner as body is moved by body, it is impossible it could be produced immediately by Mind, as I shall, in the sequel, demonstrate. I shall, however, in the present argument, suppose, with his followers, that the projectile motion is the immediate operation of the Supreme Mind. But, even upon that supposition, it is still true, that the system of the heavens is a machine, according to the definition above given of a machine, since it goes on without the constant and immediate agency of Mind. As to gravitation, he has, in the Queries subjoined to his Optics, endeavoured to account for it by a subtile fluid, which moves the bodies that gravitate towards each other. But this is an *occult cause*, if ever there was one ; for, in the *first* place, there is no evidence that any such fluid exists ; and, *secondly*, if it did exist, he has not shown how it could produce such wonderful effects *. And, further, I say, that it is absolutely inconceivable how a fluid, with which he fills the celestial space, should be able to impel such vast bodies, and yet, at the same time, not resist their motions, and so, by degrees, destroy the projectile force : For what can impel can resist, and what can,

* See what I have said further upon this subject, page 197. It is only this cause assigned to gravitation, which can be called an occult cause, in the Newtonian philosophy ; for those who speak of gravitation itself as an occult cause, do not appear to me to understand what they say ; for gravitation is the motion itself, which undoubtedly has an existence, at least, here on earth ; but the question is concerning the cause of that motion.

cannot resist cannot impell. But, besides this, it appears to me very extraordinary, that a Theist, such as Sir Isaac Newton certainly was, should ever attempt to ascribe to mere matter, a motion so regular and orderly as gravitation, the force of which increases in a certain determined proportion to the time it continues, and the space it goes through. I do not wonder, therefore, that this way of mending Sir Isaac's philosophy is now generally, I believe I may say universally, rejected by all his followers. And, indeed, if it could be admitted, it only puts the difficulty a little farther off; for, since Body cannot move Body, unless it be first moved itself, What is it that moves this fluid?

Setting aside, therefore, this cause of gravitation, there remain only other four causes which can be assigned for it. The *first* is, That it is essential to matter. *2do*, It is produced by a *vis impressa*, or a force originally impressed upon the body, by which it still continues to be moved in the same manner as it is moved by the projectile force. *3tio*, It is produced by pulsations continually repeated, by which the body is impelled with a force constantly accumulating towards the center. Or, *lastly*, It is the effect of the immediate and continual agency of Mind. If the fluid be out of the question, I think it is impossible that any other cause can be assigned for this motion.

As to the first of these; to maintain that matter can of itself, and by its own nature and essence, move itself, and in a manner too so orderly and regular, is, I think, downright atheism, of that species of it which was maintained by Strato the Peripatetic, and is called, by Cudworth, the *hylozoic* *. To say, as Mr Locke says, that God may have superadded to matter the power of thinking, or of moving itself, is to speak like a man who does not know the distinction

* See what I have further said upon this species of Atheism, page 240.

distinction betwixt Body and Mind ; for what else is Mind but that which moves, and thinks, and operates, according to rule and measure ? And he might have as well said, that we ourselves were nothing else but matter, with the power of thinking superadded to it, which is so far true, that, in us, a thinking substance is joined with a material substance in a most wonderful, and to us incomprehensible, manner. But, I hope, none of my readers imagine that the substances are not distinct, or that thought is not a quality entirely contradictory and repugnant to the nature and essence of matter *.

Neither will the *vis impressa* account for gravitation ; for it is impossible to conceive that a force but once impressed, and not repeated, should make a body not only continue in motion, but with a force continually increasing, as the distance from the body to which it gravitates decreases ; and this in a fixed determinate proportion.

The *third* way of accounting for gravitation is what Sir Isaac has chosen ; but, as I have said, it is rather giving an account how it operates, than assigning a cause for it. I do not wonder, therefore, that most of the Newtonians are now disposed to adopt the only other alternative remaining, and to agree with Dr Clarke †, that gravitation is produced by the immediate and constant agency of Mind ; for, if this motion be not produced by a fluid, or any other material cause, it must of necessity proceed from Mind. And this, I think, is a very great correction and improvement of Sir Isaac's system ; for, as Mind cannot be under any necessity of acting by repeated impulses, but must be supposed to act constantly and uniformly, his system is freed from the incumbrance of those *polygons* of an infinite number of sides,

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of

* See what I have further said upon this subject, p. 278.

† See concerning Dr Clarke's philosophy, page 225. and 282.

of which he composes the orbits of the planets. These sides of polygons always increasing in number, and diminishing in magnitude, become at last evanescent, as he expresses it, and undistinguishable from the curve. Instead of these, which only his hypothesis of gravitation, acting by repeated impulses, made necessary, we must suppose Mind to be always carrying the planet, with a steady tendency, towards its center, of such a force, that, if the planet were let loose from its orbit, it will go to the center with a force accelerating as the squares of the distances inversely.

But, however great this improvement may be, I think it is evident, that Sir Isaac, when he wrote his *Principia*, had no idea of the celestial motions, or any part of them, being produced by the constant agency of Mind, as I shall afterwards more clearly show : But a farther correction, I think, will still be necessary, in order to make Sir Isaac's philosophy stand firm upon sound metaphysical principles.

And here I know I shall be laughed at by those who understand no science higher than mathematics, which they are pleased to call Philosophy, and have only examined the lines, and figures, and calculations, of Sir Isaac's system : But, if I have any readers that have accompanied me thus far, I hope they, at least, will be convinced, that the principles of all science are to be found in this first science ; and that, if the principles of any inferior science cannot bear a strict metaphysical examination, that science does not stand upon a sound foundation.— But to proceed :

Even this amendment of Sir Isaac's system removes but one-half of my objection to it ; for still one part of the motion of the planets is mechanical, I mean the projectile motion ; for, as I have said, whatever motion goes on of itself, without the continual agency of Mind, is me-

mechanical. Sir Isaac's system, therefore, halts clumsily enough betwixt Mind and Mechanism ; so that the antient system which I defend has, at least, the merit of being more simple and uniform, which ascribes the motion wholly to Mind acting indefinitely upon the planet.

I know very well that, in the age in which we live, the authority of the antients goes for very little. We can now only desire *veniam antiquis, non laudes et praemia* ; and the fashionable language among our philosophers at present is, that the antients did very well, considering the times in which they lived ; but, had it been their happiness to have fallen into an age so learned as ours, they would have done much better. But there is a modern authority, which should dispose the candid reader to listen, without any violent prejudice to the argument, by which I will endeavour to prove, that the planets are not moved mechanically in any part of their motion, but altogether by the immediate and constant agency of Mind. The authority I mean is that of Dr Samuel Clarke, which I have already made use of, but must again have recourse to it. And the reader will have the greater regard to it, that he was not only one of the best scholars, and greatest metaphysicians, in modern times, but was also very learned in Sir Isaac's philosophy, and intimately connected with him, having translated into Latin some of his works ; so that he cannot be suspected of any prejudice against him or his philosophy. Now, the Doctor's opinion is clear and express, that all the great motions in the universe are caused by some immaterial power continually exerting itself, and not acting by any motion originally impressed upon the bodies ; so that, though he acknowledges the truth of Sir Isaac's first law of motion, that body, once put in motion, continues in that state till it be stopped by some external cause ; yet he rejects the notion of the celestial bodies continuing to move in consequence of any impulse once

given them without the constant agency of Mind ; and therefore his opinion must be, that they are moved by Mind in the same manner that our bodies are. To this purpose, I have quoted two passages from the Doctor, (page 235. and page 282.), and I shall give again the words of the last passage, upon another part of this argument.

CHAP.

C H A P. II.

The Question betwixt Sir Isaac and the Antients stated—a Question not within the Sphere of Mathematics, but belonging to the First Philosophy; it relates to the Moving Powers in the Universe—These either Mind or Body—Body moves Body only by Contact—therefore no such Thing as its Action in vacuo—The Manner in which Body moves Body threefold—The Manner in which Mind moves Body altogether different—well described by Dr Clarke—The Distinction of the different Kinds of Motion applied to the Solution of the Question—According to Sir Isaac's Hypothesis, one Part of the Planetary Motion produced by Mind immediately; other two Parts of it produced only mediately by Mind—But all the Motions proved, by sundry Arguments, to be immediately produced by Mind—Projection and Gravitation such mere Hypotheses, that some Newtonians are disposed to give them up; but they say the Circular Motion has, by its Nature, a Tendency both to and from the Center—This Hypothesis examined in the next Chapter.

THE question, then, betwixt Sir Isaac and his friend Dr Clarke, (not to mention the Antients,) is, Whether the celestial bodies are not altogether moved by the continual agency of Mind; or whether, at least, one half of the motion is not produced by a force once impressed upon them, but continuing perpetually? This is the question fairly stated, according to the amendment made upon Sir Isaac's system, by his later followers.

This is a question that goes entirely out of the sphere of mathematics into a philosophy, that Sir Isaac does not appear to me ever to have studied ;;

studied ; the philosophy, I mean, is metaphysics, and the philosophy of Mind ; for, by mathematics, after having discovered, from observation, certain phaenomena concerning the motion of bodies, we can investigate theorems concerning the velocity and force with which they are moved, the spaces they pass through, and their positions with respect to one another. But the question here is concerning the principle of motion in these bodies—What is the moving power?—and in what manner that power operates so as to produce the motion?—These are questions, in which geometry, mechanics, or calculation, can be of no use. Whether a genius like Sir Isaac's, that excelled so much in lines and figures, could have made the same proficiency in the study of Mind, and of the first philosophy, is what I will not pretend to determine ; but this, I think, I know very certainly, that, however great Sir Isaac's genius was, even for metaphysics, he could not understand it, without having studied it. And this, farther, I think, I know also, with great certainty, that, let a man be ever so great a geometer, yet, if he be not learned in the first philosophy, he cannot understand even the principles of his own science.

The first thing to be considered in this inquiry, is the moving power. Every body that is moved, (and nothing but body can be properly said to be moved *), is moved either by some other body, or by Mind ; I mean by body immediately ; for, according to my philosophy, Mind is ultimately the only moving power in the universe. When body moves body, the body moving must necessarily be in contact, either mediately or immediately, with the body moved ; for I hold, that such of the Newtonians, that speak of bodies at a distance attracting one another, speak without having an idea of what they say, unless they can show that there is some medium betwixt the bodies, by which they can operate upon one another. An attraction, there-

* See this demonstrated, page 286.

therefore, *in vacuo*, betwixt the sun and the planets that move round him, or betwixt the moon and our earth and seas, is a non-entity absolutely inconceivable. And, therefore, as the word *attraction* denotes the one body operating upon the other, in the way of drawing it to it, and indeed it can denote nothing else, it ought to be laid aside altogether; and, in place of it, the word *gravitation*, or the tendency of the bodies to one another, which is the way that Sir Isaac himself has explained gravitation, should be used *.

Body, therefore, can only move body by impulse; and this in two ways; either by the moving body propelling the other body; or by drawing it to it, in the way that the weights in a balance weigh down the scale. The first way is subdivided into other two; for, either the body, propelling the other, continues in contact with it, and is carried along with it, and this way of body moving body may be called *trusion*; or the propelling body makes the other body change its place, without following it, or continuing to be in contact with it; and this way of body moving body may be called *pulsion*; so that body moves body *by drawing it to it, by trusion, or by pulsion*. And in these three ways only can body move body.

When Mind moves body immediately, and without the intervention of other bodies, it does it, I apprehend, in a manner quite different. What that manner is, we cannot positively say; but, negatively, we can say that it does not move it by impulse, as body moves body; for we cannot conceive that an immaterial substance, without solidity or resistance, can impel any body, because it is only by its solidity and resistance that body can impell or be impelled; so that, what is not body, that is, what has not parts continuous and cohering, can neither act nor suffer in that manner. Further, as body can operate
only

* See more upon this subject, page 185. 186.

only upon body by touch, whether in the way of propelling or attracting, we are taught, even by the philosophy of Epicurus, that nothing but body can touch or be touched.

* Tangere enim, et tangi, nisi corpus nulla potest res *.

Negatively, therefore, we can say, with great certainty, that Mind does not move body, either by propelling it, or attracting it, or touching it in any way. And, if we would know any thing more positive about it, I think it may be fitly compared to the power of gravitation, as it is very well described by Dr Clarke, in his Discourses upon the Evidences of Natural and Revealed Religion, in the following words: 'That most universal principle of gravitation, itself the spring of almost all the great and regular inanimate motions in the world, answering (as I hinted in my former discourse) not at all to the surface of bodies, (by which alone they can act one upon another), but intirely to their solid contents, cannot possibly be the result of any motion originally impressed on matter, but must, of necessity, be caused by something which penetrates the very solid substance of all bodies, and continually puts forth in them a force or power intirely different from that by which matter acts on matter; which is, by the way, an evident demonstration, not only of the world's being made originally by a Supreme Intelligent Cause, but, moreover, that it depends every moment on some superior being for the preservation of its frame; and, that all the great motions in it are caused by some immaterial power not having originally impressed a certain quantity of motion upon matter, but perpetually and actually exerting itself every moment, in every part of the world; which preserving and governing power, whether it be immediately the power and action of the same Supreme Cause that created the world, or of some subordinate instruments appointed by him to direct and preside respectively over certain parts thereof, does, either way, give us a very noble idea of Providence.' This account of

* Lucret. lib. 1. v. 305.

of the Doctor's gives a very good reason why Mind cannot act upon body in the same manner that body does, namely, because body acts upon body by its surface; for it is only by the surface that body can touch body; and, as I have said, it is only by contact that body can operate; and he perfectly agrees with my notion, that Mind is the moving principle of bodies that gravitate towards each other. But, if it were impossible for us to give any account at all how Mind moves body, we ought not therefore to deny the fact, of which we have the clearest evidence that we can have of any thing—consciousness: And, to pretend that we can account for every thing that happens in Nature, is neither more nor less than to pretend to know all the secrets of the Almighty; one of the greatest of which is that wonderful manner in which he has joined together two things of natures so very different as Mind and Body, with such a close and intimate union.

I shall only further observe on this head, that, with respect to the motion of Body by Mind, there appears to be a difference betwixt organized and unorganized body: For, upon organized body, it is evident that Mind operates by certain organs; whereas, upon unorganized body, it appears to operate more immediately, without the intervention of any organs; so that, however extraordinary the assertion may seem, I hold it to be true, that the action of Mind, in a stone falling, is more obvious, because more immediate, than in the actions of our bodies.

Having thus laid down the distinction betwixt the two motive powers, and their different manners of acting, I proceed to apply this distinction to the question in hand. And, in the *first* place, I admit that, when body is moved in a circle by body, the motion must of necessity be combined in the manner that Sir Isaac says the motion of the planets is combined; for I have no idea, nor do I believe that any other man has, of any body moving another body otherwise than

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in a straight line, whether it move it by propelling or attracting it: So that, if Sir Isaac were a materialist, and believed that body was only moved by body, and, if I were of the same opinion, we should be perfectly agreed, and I should admit that the planetary motion was altogether mechanical. But Sir Isaac was not a materialist; for, *1mo*, He believed that all motion was originally from Mind, and that the projectile impulse, if not *immediately*, was *mediately*, and by the intervention of other bodies, from the Deity; though, even supposing it to be, as his followers say, immediately from Deity, still the motion, as I have observed, is mechanical, in so far as it goes on without the constant agency of Mind. But, *2do*, it now seems admitted by the Newtonians, that gravitation is produced by the constant agency of Mind: And so far, therefore, the planetary motion is certainly not mechanical.

Thus, it appears, that, as the Newtonian philosophy is now modelled, all the motions of a planet are admitted to be, *mediately*, or *immediately*, produced by Mind. One of these motions, they say, is the immediate operation of Mind, viz. the motion of gravitation. The only question, therefore, is concerning that motion by which it goes on in its orbit, whether it be in consequence of a projectile impulse given it in a straight line, or whether it be produced by the immediate agency of Mind, like the other motion. The latter opinion is what I maintain; and I say, that the celestial bodies are uniformly moved in all their motions, and in every part of their motions, by the constant agency of Mind.

On the other hand, the Newtonians, admitting that one part, which composes the planet's motion in its orbit, viz. its gravitation, is produced by the immediate and constant agency of Mind, maintain, that the other part of that motion is produced only *mediately* by Mind, that is, by means of a projectile impulse. And there is a third motion of the planet, viz. its motion on its axis, which, they say, also is produced by a projectile

jectile impulse ; so that the planet, being once set a-spinning, like a top, continues to do so, without any further agency of Mind ; whereas I say, that all the three motions are produced by the immediate and never ceasing agency of Mind, and that its motion in its orbit is as simple and uncompounded as the line in which it is performed, or as a motion in a straight line, with which, therefore, Aristotle fitly compares it *.

And, *1mo*, I think it must be admitted, that, as the manner of Mind moving body is so different from that of body moving body, it is at least probable that the motion is begun and carried on in a different manner.

2do, If Mind be in this case the moving power, as Sir Isaac admits, if not immediately, at least mediately, and Mind Intelligent, or at least directed by Intelligence, it is impossible to suppose but that such a Mind would perform the motion in the most natural and direct manner, without taking the circuit which Sir Isaac supposes, of first projecting the body in a straight line, and then bending that line into a curve. If, indeed, the doctrine of the materialists were true, that matter had, in itself, the power of moving itself, and that, therefore, gravitation was an essential property of matter, the projectile motion was absolutely necessary, in order to counteract the material necessity by which the body was moved towards the center. But, since gravitation is no essential quality of matter, there is no necessity for the impulse in the straight line, nor, by consequence, for gravitation, but both are entirely superfluous, unless it could be demonstrated, that it was impossible for body to be moved in a circle or ellipsis, even by Mind, without the motion being in a straight line. But this,

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* Aristotle, *De Coelo*, cap. 2. where he says, that the only two simple motions are, the motion in a straight line, and that in a circle.

I think, is hardly to be conceived, far less to be demonstrated ; for to me, who am not learned in the sublime geometry, and in the doctrine of prime and ultimate ratios, it does not appear possible that any part of the circular motion, not even the least part, can be in a straight line ; and, therefore, I cannot conceive how the motion should begin in a straight line, which, however, is Sir Isaac's supposition. And I think it is very near as difficult to conceive how the same Mind should first move the body towards the center, and then impell it in a straight line from the center, though, if that were the case, there would be no part of the orbit in a straight line. If, indeed, the motion were produced by different powers, this, as I have said, would be necessary. But it is hardly conceivable how one and the same moving power should, in the same motion, and at the very same instant, act and counteract itself. But further—Supposing the possibility were admitted of Mind producing a circular motion in this indirect and round about way, either by first projecting it, or first moving it towards the center, I think it cannot be denied but that, at least, it is possible that Mind may give a circular motion to body in the simple and direct manner, as we know, from certain experience, that our Mind can move our Body in a circle, without beginning, either by a motion in a straight line, or by a motion towards the center ; and, if it be possible to be done in that plain and simple way, we must presume that, as Supreme Intelligence presides in the universe, it is done in no other way.

But, *3tio*, If it be true what I have laid down, supported by the authority of Doctor Clarke, that it is impossible, by the nature of things, that Mind can move body, as body moves body, that is, by impulse, there is an end of Sir Isaac's system, so far as it is founded upon the projectile motion ; for that motion can be understood to be nothing else but an impulse by which the body is moved in a straight line ; and so, I believe, it is understood by all the Newtonians. Now, if it be true, that it is impossible that Mind can act upon body in the way

way of impulse, there is an end, both of the projectile force and of gravitation ; both which would have been absolutely necessary, if the circular motion of the planets had been produced by bodily impulse ; for it is, as I have said, impossible to conceive that body can move body otherwise than in a straight line ; but it is equally impossible to conceive that Mind can move body by impulse ; and, therefore, if Mind be the power that moves the planets, both projection and gravitation are not only unnecessary, but altogether inadmissible, as repugnant to the idea of Mind moving body, and serving no other purpose but to produce a motion, which not only may be produced without them, but cannot be produced by them, where Mind is the agent.

I omit here what I have urged in the body of this work, that Sir Isaac's philosophy is not comprehensive enough to take in all the systems of Theism, and that it excludes all the philosophers of antiquity who believed in God, but, at the same time, believed that the world was eternal ; for, upon that supposition, there could have been no impulse, or projectile force, which must necessarily have been given at some particular time.

The fact of the projection of the planets, and the supposition of the power of gravitation extending over the universe, at least over all our solar system, and of the motive powers of the planets being so strangely mixed, that one third part of their motions is produced by Mind, the other two by mechanism, are such mere hypotheses, and so unfit to be the principles of any science, that I find some of the Newtonians, with whom I have conversed, disposed to give them up. But, say they, the circular or elliptical motion, however produced, whether by Mind or bodily impulse, is, of its nature, not simple, but combined of a centripetal and a centrifugal force, which will answer all the purposes of Sir Isaac Newton's astronomy, and explain all the phaenomena of the heavens in the manner he has done.

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This is a question that I do not think of great importance, as the point of the projectile impulse, and of the planets being carried on by that impulse, is given up, and it is admitted that the bodies are moved, in all their several motions, by the immediate and constant agency of Mind. It was on account of that principle assumed by the Newtonians, and which, I think, is a step towards materialism, that I have been led to make these observations upon Sir Isaac's philosophy. That nothing, however, may be omitted, concerning the principles of a philosophy which is at present so generally prevalent, I will likewise examine this position, the more especially that I have to defend here likewise the doctrine of my Masters, the Antients, who have asserted that the circular motion is as simple as the rectilinear *.

* See Aristotle, *De Caelo*, cap. 2. ubi supra.

C H A P. III.

Upon the Supposition of the Circular Motion being, by its Nature, combined of a Centripetal and a Centrifugal Force, no Occasion for the Hypothesis of Projection and Gravitation—No need, also, for the First Law of Motion—That every Motion in an Orbit is so combined, not a Self-evident Proposition,—altogether improbable, as the Moving Power is one simple Power—Sundry Reasons given why it is impossible it should be so—Sir Isaac has proved nothing to the contrary—All his Definitions, Laws of Motion, and Demonstrations, concerning it, relate only to Motion produced by bodily Impulse—The Circular Motion, though produced by Mind, may be resolved into the combined circular Motion of which Sir Isaac speaks—This sufficient for the Purpose of Sir Isaac's Philosophy.

AN D, in the *first* place, I should be glad to know, if this doctrine be true, for what purpose have the Newtonians spoken so much about projection and gravitation, and 'founded their science upon hypotheses, which appear now to be altogether unnecessary?

2dly, I desire also to know for what purpose they have laid it down, in their first law of motion, that a body, once put in motion, does perpetually continue in motion till it be stopped by external impediment, a law which appears to me to be laid down by Sir Isaac for no other purpose than to account for the planetary motion, upon the hypothesis of projection, which is now given up?

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But, to come to the point :—I think it must be admitted, that we have, at least, an idea of a circular movement, without any tendency either to the center, or from it, and an idea derived from that great source, and, indeed, only source of all our ideas concerning the operations of Mind, I mean consciousness ; for we are sure, by our own experience, that, when our Mind moves our body to go round in a circle, it performs that motion, without either centripetal or centrifugal inclination. It is true, that, when we perform the motion quickly, and repeat it often, we have a tendency to go out of the circular line in the tangent ; and therefore we are obliged to incline our bodies inwards towards the center. But there are two things to be considered ; *first*, That Mind moves our body, not immediately, but by the intervention of organs ; whereas, the planets being, as I observed, unorganized bodies, are immediately moved by Mind. *Secondly*, By means of those organs, our bodies are moved in parts, one-half before the other ; whereas, we cannot conceive a sphere or spheroid to be otherwise moved than altogether. To these considerations, it may be added, that the Mind which animates those celestial bodies, we ought to conceive as much more perfect than our Minds, and, consequently, that they can perform the circular motion much more regularly than we can do ; and, in general, that all their movements are infinitely more regular than ours. And, besides, we cannot conceive that their Minds are so much affected by their bodies, as ours are ; for, otherwise, they would grow dizzy, and contract a terrible vertigo, by going round always the same way, and with such prodigious velocity.

It is certain, therefore, that we have an idea of such a motion, and that, to suppose the existence of it, implies no contradiction or inconsistency. It cannot, therefore, be laid down, as a self-evident proposition, which some are much inclined to do, that every motion in a circle or ellipsis, however produced, is necessarily combined of a centripetal and a

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centrifugal force ; but it must be proved ; and the stricter proof will be necessary, that it appears to be contrary to common sense and observation.

2do, Even where a motion is produced by powers operating in different directions, it is perfectly simple ; the motion I mean is that in the diagonal of the parallelogram, of which the two sides are the lines of the direction of the two powers acting upon the body. But, in this case, where there is but one power that produces the motion, and that acting internally, and upon every particle of the body, not upon the surface only, as Dr Clarke has well observed, there is still less reason for supposing that the motion should not only be combined, but so intricately combined, as to consist of three several motions ; one, by which the body moves forward in the circle ; another, by which it inclines to the center ; and a third, by which it tends to fly off in a tangent ; and all these several tendencies acting upon the body at the same time, and in every instant of its movement. Is it not much more natural to suppose, that the motion is as simple as the power that produces it, or as the line which it describes, and which, by its nature, is as simple, and as little compounded, as a straight line ?

But, *3tio*, To come closer to the point, it is a principle of metaphysics, which cannot be disputed, that nothing can exist without a cause. Now, where there is neither projection nor gravitation, what is there that can produce this double tendency in the body to and from the center ? In the motion of projectiles on earth, where all the three tendencies above mentioned are undoubtedly combined, it is easy to account for each of them. It is the force impressed by the impulse of body, which makes the body go forward in its course ; and it would go forward in a straight line, but for the power of gravitation, which bends it from the straight line towards the earth. And hence come the two other tendencies, the one centripetal, by which it inclines

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downwards, the other centrifugal, by which it tends to go in a straight line, according to the direction in which it was at first moved. But, where there is no impulse or projection, and no gravitation, but the body is only moved forward in a curve, it is to me inconceivable how it should have a tendency, either to the center, or from the center.

I have insisted the more upon this example of projectiles on earth, that it was from them, as is generally believed, that Sir Isaac took the first idea of his system. And it is no doubt true, that the motion of the celestial bodies may be analyzed into the motions which compose the motion of these projectiles; but, because the motion of the celestial bodies could be so resolved, Sir Isaac from thence too hastily concluded, that they were actually so combined, without attending to this essential difference betwixt the two motions, that the one was produced by bodily impulse, the other immediately and directly by Mind. Add to this another most material difference, that, in projectiles on earth, there are two moving powers quite distinct from one another; the one, bodily impulse, by which the body is projected; the other, Mind, or whatever other power operates by gravitation. Now, that these two powers, so different, and acting so differently, as to counteract one another, should produce a motion combined of different tendencies, is no wonder. But it is to me altogether inconceivable, how one and the same power, acting upon the same body, should give it two tendencies at the same time, so different as the centripetal and the centrifugal.

410, That the different tendencies to and from the center of the celestial bodies moving in a circle or ellipsis, as well as of projectiles here on earth, are caused by two different forces acting upon them; and, that the centrifugal tendency is the effect of the projectile force, and the centripetal of gravitation, is, I think, acknowledged by the Newtonians, when they tell us, that, if the projectile force be great,
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and the gravitation small, then will the curviture of the circle be small, and nearer to the straight line. If, on the contrary, the gravitating force be great, and the projectile small, then will the curviture of the orbit be greater, and recede farther from the tangent or straight line; for, say they, effects must be proportional to their causes*; which is plainly saying, that the projection is the cause of the centrifugal tendency, and gravitation of the centripetal: So that, if there were neither projection nor gravitation, there would be neither centrifugal nor centripetal tendency.

5to, Whether the motion was from all eternity, or had a beginning in time, can make no difference as to the nature of the motion. Supposing, then, the motion never to have had a beginning, there could have been no projection, and, if no projection, no centrifugal tendency; as it has been shown that this tendency is produced by the projection, and is greater or less, in proportion to the projectile force: And, if there be no centrifugal tendency, there can be no centripetal; it being impossible to conceive that, in the circular motion, there can be the one without the other. And this is another proof, that, from the nature of the motion merely, there arises neither of the two tendencies.

6to, If it were admitted that, by the nature of the circular motion, the body had a tendency to go to the right and to the left—to the center and from it; yet, even this admission would not serve the purpose of Sir Isaac; for his mechanism of the heavens requires, that he should likewise prove, that, by the nature of the motion, the body has such a tendency to go out of the circle on one side, that, if it were not restrained, it would fly off in a tangent, and continue its motion

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* See Sir Isaac's *Principia*, vol. 1. def. 5. with the Commentaries of Thomas Le Seur, and Frances Jacquier.

in that straight line forever : And, further, that it has so violent a tendency the other way, that it would be carried to the center by a force which increafes, as the fquares of the diftances, inverfely ; for all this muft neceffarily follow, if projection and gravitation are laid afide, and the centripetal and centrifugal forces afcribed only to the nature of the movement.

From thefe confiderations, it appears to me altogether unaccountable, how the circular or elliptical motion fhould be, by its nature, neceffarily combined, and not as fimple as the line in which it is moved. There are, however, fome of Sir Ifaac's followers, who pretend that he has demonftrated, by lines and figures, and geometrical neceffity, that it is fo combined ; and, as I know that geometry has its paradoxes, as well as other fciences, I was at firft difpofed to believe that it might be fo ; but, upon looking into the *Principia*, I was convinced that Sir Ifaac there only treats of one of the two kinds of motion mentioned above, viz. of motion produced by the impulse of body upon body ; nor does he appear to me to have had any idea of the motion of body by Mind, at leaft, of the manner of that motion. And, accordingly, it is evident, both from his definitions, and from his laws of motion, that he fuppofed the motion of the celeftial bodies to be compofed of different motions in ftraight lines, that being the only motion which can be produced by body a&ing upon body *. Of this kind is the projectile motion of the planets,

* That Sir Ifaac, in his *Principia*, fpeaks only of this kind of motion, is evident, as I have faid, both from his definitions and his laws of motion ; for, in his third definition, he lays it down, that there is refiftence in every body which changes its ftate, either of reft or of motion. Now, this cannot be conceived, unlefs it be impelled by another body ; for it can refift nothing that is not folid and extended like itfelf, and which therefore refifts as much as it is refifted. And, accordingly, the Commentary upon this definition plainly fuppofes that it applies only to the a&ion of body upon body ; for he fays, ' Etenim, nulla poteft effe a&io corporis in corpus, quin lu&tatio quaedam, ut loquitur Clar. Hermanus, in *Phoronomia*, fiat inter corpus agens et pa-

nets, which, though he had supposed to be the immediate operation of Mind, as his followers do, yet, having no idea, such as his friend Dr Clarke had, of the manner in which Mind moves body, he supposed it to be by impulse, in the way that body moves body: And of the same kind is his motion of gravitation; and which, therefore, he endeavoured to account for by the impulse of a fluid.

In order to show how, from these two rectilineal motions, the circular motion may result, he has made use of his doctrine of prime and ultimate ratios; and, by the means of sides of polygons, *evanescent*, as he calls them, that is, growing infinitely less and less, as they increase in number, he accounts for the circular motion being produced by projection and gravitation, though both operating in straight lines*.

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‘*tiens, dum alterum alteri resistit; alioqui corpus motum posset, sine motus proprii detrimento, aliud quodcunque movere.*’ This, surely, cannot be understood of motion by Mind. And, in the 4th definition, where Sir Isaac speaks of the *vis impressa*, he says it is ‘*Diversarum originum, ut ex ictu, ex pressione, ex vi centripeta.*’ Now, the *ictus* and the *pressio* can certainly be understood only of the action of body upon body. And, as to the *vis centripeta*, in the following definition he compares it to that force by which a stone in a sling is kept from flying off, and which is certainly, as he explains it, by the action of the hand retaining the stone, that would otherwise fly off. Of this kind, he tells us, is the motion of the planets, which, by the same means, are drawn from the rectilineal motion, and obliged to revolve in curve lines; and he adds, ‘*et par est ratio corporum omnium quae in gyrum aguntur.*’ And his laws of motion also relate to the same kind of motion; particularly his third law, concerning *action* and *re-action*, which he expresses in the following words: ‘*Actioni contrariam semper et aequalem esse re-actionem, sive corporum duorum actiones in se mutuo semper esse aequales, et in partes contrarias dirigi.*’ Here the rule is expressly applied to two bodies acting upon one another; and the explication he gives of the rule will only apply to such a case: ‘*Quicquid premit vel trahit alterum, tantundem ab eo premitur vel trahitur; si quis lapidem digito premit, premitur et hujus digitus a lapide.*’ This it is impossible to apply to the action of an incorporeal substance upon body.

* This doctrine of prime and ultimate ratios belongs to what we call *fluxions*, and the French call the geometry of the *infiniment petits*. I have been told that some geometers, and particularly the late Dr Simson of Glasgow, had a great deal of doubt of the doctrine of prime and ultimate ratios, and wrote something against it, which, however,

Now, if a circular motion can be produced in this way, any motion of the same kind, though not produced in the same way, but resulting from the operation of Mind, may be resolved or analysed in the same way; just as motion in a straight line, though produced by one single impulse, and therefore perfectly simple, may be resolved into two forces acting in the direction of the two sides of the parallelogram, of which the straight line is the diagonal. And this is a resolution of the motion in a straight line, which Sir Isaac has used very much*.

It is, therefore, I think, true, what I have observed elsewhere †, that this resolution or analysis of the circular motion will serve Sir Isaac's purpose, without embarrassing his system with hypotheses of projection and gravitation, centripetal and centrifugal forces; for, if the motion can be resolved into these two powers of projection and gra-

ever, was never published. If there were any defect there, I doubt it would overturn the whole theory of projection and gravitation: But this I leave to the consideration of the geometers, and of those who are learned enough in fluxions, to understand Mr M'Laurin's defence of them.

* See the *first* proposition of section 2d, book 1st, and the *second* proposition of the same section. I have been told, that, from these two propositions, it may be inferred, that the circular motion is, by its nature, combined: But, in the first of these propositions, he only demonstrates, that a body, moved in a circle round an immoveable centre, will, by *radii* drawn from the circumference to the center, describe areas proportionable to the times of the motion: And, in the second proposition, that, if a body moved in any curve line, describe areas, formed by *radii* drawn towards any point, proportionable to the times, the body is impelled by a centripetal force towards the same point. And it is evident that both the propositions are demonstrated by the resolution of the circular motion into the motions of projection and gravitation: So that the demonstrations plainly suppose, what indeed is the hypothesis of the whole book, that all motion is primarily and originally in straight lines, being produced by bodily impulse, which certainly can produce no other motion, unless when two such motions, in a straight line, are combined in the manner Sir Isaac supposes.—In short, through the whole Principia, he treats of no other motion but that which is produced by body operating upon body: And his notions appear to me to have been so gross, and so little raised above matter, that he had no idea of any moving power, except that alone which is perceived by sense; I mean body.

† See page 237.

gravitation, it is perfectly agreeable to the analogy and regularity of nature, that it should follow the laws of these two powers, and, that a circular motion, though produced by Mind, should have the same properties as a circular motion produced by bodily impulse, in the way that Sir Isaac has described it. And, in this way, that exact similarity which Sir Isaac has discovered betwixt the motion of the planets and of projectiles on earth, and which, in my apprehension, is the greatest discovery that Sir Isaac has made, will be easily accounted for.

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C H A P. IV.

The Foundation of the Mechanical Philosophy is Sir Isaac Newton's First Law of Motion, so far as it relates to the perpetual Motion of Bodies once set in Motion—This Proposition ought to be strictly examined, as it is of dangerous consequence to the Doctrine of Theism—The whole Law considered—Two Parts of it undoubtedly true—the third Part, concerning the continuance of Motion, only disputed—The meaning of vis insita, in this Law, opposed to vis impressa—This Law relates only to motion produced by Bodily Impulse, therefore cannot affect what has been said of the Motion of the Celestial Bodies by Mind—comprehends the circular Motion as well as the rectilineal—The Advantage that the Atheist will make of the Concession that Matter can move itself—The Proposition, if true, must be either self-evident or demonstrable—not Self-evident—can only be demonstrated a priori—The Question altogether metaphysical—Rest and Motion confounded in this Law of Motion—Strange Inaccuracy of Expression—The Question is concerning the Essence of Matter, and whether Motion be essential to Matter—That it is not essential to Matter, proved by several Arguments—How the Motion is continued, after the Pulsion has ceased, accounted for—That this Motion is not continued for ever, proved by several Reasons—Objection answered.

I Think I have said enough, in the preceding chapter, to show that the hypothesis of projection and gravitation is not only unnecessary, but impossible, upon the supposition of the celestial bodies being moved by Mind immediately and directly ; but, as I am very desirous
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to put an end altogether to this *mechanical* philosophy, I will go a little farther in this chapter, and will endeavour to show the falsity, as well as the dangerous tendency of that part of Sir Isaac's first law of motion, which asserts, that body, once put in motion, will continue to move uniformly in a straight line, unless it be stopped, or its motion changed by something external. This law of motion Des Cartes first laid down, by which he has made a machine of the whole universe; and it has been adopted by Sir Isaac, in order to make a machine of the heavens, and a machine of a most extraordinary kind, of which there is no other example in art or nature; for all other machines that we know are moved by the constant agency of the moving power; whereas, both Des Cartes and Sir Isaac's machines continue to be moved after the moving power has ceased to act.

This is that original impressed motion which Dr Clarke, in the passage I have quoted above, rejects, in the great motions of the universe. And it was the authority of so great a scholar and philosopher that first disposed me to call in question this maxim, which I before submitted to as an axiom that could not be disputed, not having any propensity to differ from opinions generally received, unless I see a very good reason for it. And I was the less inclined to deny the truth of the proposition altogether, that Dr Clarke, as I have observed, admits it, though he says it does not apply to the motions of the celestial bodies. But, for the same reason, that it does not apply to them, I am convinced, upon mature consideration, that it does not apply to any thing in nature, and is not only false, but tending, in its consequences, towards absolute materialism, though, I am persuaded, that Sir Isaac had no such thing in view, whatever Des Cartes might have had.

This whole law of motion, as enunciated by Sir Isaac, is as follows:
 ' All bodies persevere in their state, whether of rest or of motion,

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'uniformly in a straight line, unless in so far as, by some force impressed upon them, they are obliged to change that state *.' As to the

* It is thus expressed by Sir Isaac in Latin : 'Corpus omne perseverat in statu suo quiescendi vel movendi uniformiter in directum, nisi quatenus a viribus impressis cogitur statum illum mutare.' Cicero, I believe, would have said, in *statu quietus vel motus* ; for *quiesco*, in Latin, does not denote 'rest,' but the action of one that is going to rest ; and it answers to the Greek word *ἡμίζουμαι* or *ἵσταμαι*, both which do not denote *rest*, but motion of the kind I mentioned. See Aristotle's *Physics*, lib. 6. cap. 12. in *initio*, and his Commentator, Simplicius, page 235. where a man, not acquainted with the propriety of the Greek language, will be surprised to read, *το ἵσταμαι κινείται*, and *το ἡμίζουμαι οὐκ ἵστανται ἡμίζουται*. Again, *status movendi* does not signify what Sir Isaac means to denote by it, namely, the state of a thing that is moved, is in motion, but the state of a thing that is moving, or, to make it plainer to those who are accustomed to that impropriety of language, by which we confound *moving*, and *being moved*, it is the action of moving some other thing ; for the Latin *gerund* is always used in an active sense, when it is not joined with some *noun substantive* ; so that *status movendi* is the same with *status agendi*, *status amandi*, *status legendi*, &c. Such criticisms as this, and some others that I have made upon the language of this philosophy, will, I know, appear frivolous to many ; but accurate speaking is inseparably connected with accurate thinking ; and there is some reason to suspect that those who, both in their Latin and English, confound two things so different as *moving*, and *being moved*, have not perfectly distinguished them in their thoughts, but have some confused notion that what is moved also moves, that is, moves itself.

The Greek scholar will be pleased to observe how accurately the Greek language distinguishes every thing concerning *moving* and *being moved*. In the *active* lineage, there is *το κινεῖν*, *το κινήσαν*, *το κινῆσθαι*, *το κινῆσθαι* ; that is, in English, *what moves*, or *is moving*—*what did move*—*what has moved*, and *still continues to move*, and *what is capable to move*. Again, in the *passive* line, there is, *το κινεῖσθαι*—*το κινῆσθαι*—*το κινῆσθαι*, and *το κινῆσθαι* ; in English, *what is in moving*, (an awkward circumlocution, by which we supply the want of the *present participle passive*)—*what was moved*—*what been moved*, and *still continues to be moved*—and *what is capable of being moved*, or, in one word, *moveable*. No philosopher, I think, could have distinguished better the different circumstances of the action and passion of this verb, than the common use of the Greek language has done. But, as I have observed elsewhere, (See *Origin and Progress of Language*, vol. 2d.) the Greek language was not formed by the vulgar, but was the work of philosophers, as well as grammarians, and is therefore a study, for its own sake, not unworthy of a philosopher.

the first part of this law, which says that body at rest continues at rest till it be moved by some power different from itself ; or, in other words, that body cannot move itself ; it is a proposition that every philosopher, who is not a materialist, must assent to. And it is equally certain, that body, once put in motion, cannot, of itself, alter the direction of that motion, nor make it either quicker or slower. The only question, therefore, is, Whether a body, once put in motion, can, of itself, and by its own natural power, continue the motion ? I say, ‘ of itself, and by the power of its own nature ;’ for that undoubtedly is the meaning of Sir Isaac’s *vis insita*, which Sir Isaac, in his third definition, applies equally to that power by which a body at rest continues at rest, and that power by which, being in motion, it continues in motion : And he makes it a general property of all matter ; for he says, ‘ *Materiae vis insita est potentia resistendi, qua corpus unumquodque, quantum in se est, perseverat in statu suo vel quiescendi vel movendi uniformiter in directum.*’ Now, that all matter, by its own nature and essence, and by that perfect passivity which all theists ascribe to it, and by which they essentially distinguish it from Mind, continues at rest when it is at rest, is evident ; and, by the same power and necessity of its nature, according to Sir Isaac, it continues in motion when it is in motion. What makes Sir Isaac’s meaning still further evident, is the distinction that he makes in this third definition, and in the following, betwixt the *vis insita* and the *vis impressa*, by which last he undoubtedly means an *external* force impressed upon the body, in opposition to that *internal* power essential to its nature, by which it continues either at rest or motion *.

It is to be remembered, that all Sir Isaac’s definitions concerning motion relate only to motion produced by the operation of body upon

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 body.

* I observe that the *vis insita* is translated by Dr John Clarke, in what he has written upon Sir Isaac’s principles of philosophy, *inherent force*.

body. This law, therefore, concerning the continuance of motion, is to be understood only of motion of that kind; for, as to motion produced immediately and directly by Mind, it is evident that Sir Isaac does not here speak of it, and I doubt whether he had any idea of it. This motion, we know by the most certain of all knowledge, viz. consciousness, continues no longer than the moving power continues to act; for it is in this way that our minds move our bodies. What, therefore, I have said, concerning the motion of the celestial bodies, upon the supposition that it is produced by the immediate agency of Mind, will hold good, even allowing this law of Sir Isaac's to be true.

As this law, concerning the continuance of motion, is expressed, one should imagine that it related only to motion in a straight line, and not to motion in a circle; but we must also remember that, according to Sir Isaac's philosophy, all motion, even the circular, begins in a straight line; and, therefore, if the motion in a straight be perpetual, so must the circular; and, accordingly Sir Isaac, in his explanation of this first law of motion, tells us, that a wheel, whose parts, by cohering, perpetually retract it from the rectilineal motion, does not cease to roll, except in so far as it is retarded by the air. His words are, '*Trochus, cujus partes cohaerendo perpetuo retrahunt sese a motibus rectilineis, non cessat rotari nisi quatenus ab aëre retardatur.*' And he adds, '*Majora autem planetarum et cometarum corpora motus suos, et progressivos et circulares, in spatiis minus resistentibus factos, conservant diutius.*' What he says here concerning the motion of the celestial bodies, he expresses much more strongly in his *Scholium Generale*, with which he concludes his *Principia*, and plainly tells us, that the motion of those bodies is perpetual, according to the laws of motion that he has laid down, that is, by the *vis insita*, and the *impressed force* of gravity: '*Corpora omnia in istis spatiis liberrime*

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*‘ moveri debent ; et propterea planetae et cometae in orbibus, specie et
‘ positione datis, secundum leges supra expositas perpetuo revolvi.’*

The question, therefore, is concerning the powers of matter, and the eternity of motion of every kind ; a question of the highest importance to the doctrine of theism, and the religion of nature ; for, if it be granted to the Atheist that matter can, of itself, continue to move itself, and forever too, it will be difficult to convince him that it could not, by its own power, likewise begin to move itself ; or, perhaps, he will maintain that this self-motion of matter was from all eternity, rejecting the modern distinction, expressed in barbarous Latin, betwixt eternity *a parte post*, and *a parte ante* ; and he will, it is likely, not agree to the distinction that Sir Isaac makes betwixt the *vis insita* and the *vis impressa*, but will say, if the body can, by its own native power, go on in the rectilineal line of projection, it can also go on in the centripetal line, by the same power, without the agency of any thing extrinsic, or foreign to its nature—In short, he will say, that body, for the same reason that it can move itself uniformly, that is, with the same degree of velocity, in a straight line, one way, can move itself every way, and do every thing which we see is done by motion in the universe. This question, of so great importance, is another question that cannot be determined by geometry or mechanics ; nor will Sir Isaac’s *sublime geometry*, as it is called, avail him in the decision of this question, which is altogether metaphysical, belonging to the first philosophy, whose business it is to explain the first principles of things.

The first question to be considered is, Whether it be a self-evident proposition, or only a demonstrable one ; for, if it be true, it must be either the one or the other. Now, that it is an axiom, or self-evident proposition, I cannot admit ; for it is certainly not intuitively evident, that a body can continue itself in motion, and that, being once set a-going,

going by a momentary impulse, it will go on forever in a certain direction, and with the same degree of velocity. And, indeed, if it were an axiom, it would be very extraordinary, that no philosopher ever thought of it before Des Cartes, who first devised it, to support his mechanical philosophy; and for the same reason it was adopted by Sir Isaac Newton.

If, therefore, it be not an axiom, and yet be true, it must be proved. This can be done only in two ways; either *a priori*, that is, from the nature of the thing, or *a posteriori*, that is, from fact and experiment. Now, in this latter way, it is impossible it can be proved: For, 1^{mo}, Powers and Faculties are latent things, which may be apprehended by intellect, but cannot be perceived by sense; so that it is impossible, by any experiment or observation, to discover by what power a body is moved by itself, when the operation of another body upon it has ceased. And, 2^{do}, Though the fact be true, that a body continues in motion after the impulse which put it in motion has ceased, yet, we find that all the motions so produced, do languish and decay by degrees, and, at last, stop altogether. This, I know, the Newtonians impute to some obstacle in the medium, which cannot be entirely removed by any human art; but they tell us, that the rarer they can make the medium, the longer will the motion continue; and from thence they conclude, that, if they could make a perfect vacuum, it would continue for ever; but this conclusion is far from being demonstrative; for it supposes the very thing in question, namely, that the motion is, by its nature, perpetual, and therefore can only be put an end to by something external; whereas, I say, that the motion is not, by its nature, perpetual; and therefore may cease in two ways, either by the resistance of obstacles, or by decaying and perishing through time, as every other thing in this sublunary world does.

It seems, therefore, evident, that the proposition cannot be proved *a posteriori*; and, if so, it only remains to be considered whether it can be

be demonstrated *a priori*. Now, to determine this, we must know the nature and essence of this thing we call *matter*; for, knowing it, we shall know whether motion be essential to matter or not; and, if we discover it to be essential, we shall know, with great certainty, *first*, that it moves itself, and, *secondly*, that the motion is eternal, and does continue as long as the matter exists; whereas, on the contrary, if we find that it is not essential to matter, but adventitious, then we shall know, with equal certainty, that matter does not move itself, and that, as it is moved by something of a nature foreign to it, there is no necessity to suppose that the motion will be eternal. Now, this, as I have said, is certainly a metaphysical question; for matter, abstracted from *form*, and from *Mind*, which gives it its form and qualities of every kind, is altogether a metaphysical entity.

Before I begin this inquiry, I cannot help observing, that a man who has studied the antient philosophy, will be surprised to find two things, of natures so different as rest and motion, so much confounded as they are, in this law of motion; for the principle, both of rest and motion, is made to be the same, viz. the *vis insita*, or *vis inertiae*, as it is called, by which the body continues both at rest and in motion. Now, it appears, that rest and motion are not only different in their natures, but altogether opposite; for a body at rest does not change its place, and neither acts, nor is acted upon; whereas, a body that is moved, goes through space, and is certainly acted upon; and, if so, there must be something that acts, and, if there be any thing in its way, the body itself acts, by moving out of the way the obstacle to its motion. How, then, a state of motion and rest can be compared together, and the same principle applied to both, is what I cannot conceive. I cannot, therefore, suppose, that, because a body at rest continues at rest, till it be excited to motion by something external, therefore a body, in a state so different from that of motion, continues in motion till it be stopped by something external. A man, too, who is

accustomed to the accuracy and propriety of the language of antient philosophy, will be surpris'd to find that the principle of rest and inactivity of body should be called by the name of *vis*, and denoted, both by the term *vis insita*, and the term *vis inertiae*, *nomine significantissimo*, as Sir Isaac says in his explanation of his third definition ; and he will be more surpris'd still to find the same term of *vis inertiae* applied to the principle by which body continues in motion ; and which, therefore, according to the common use of words, should be rather called *vis mobilitatis*.

But, allowing the Newtonians to speak as inaccurately as they please, though there be some reason to think that inaccuracy of expression has led many of them to inaccuracy of thinking, let us come more closely to the question.—And, in the *first* place, it must be admitted, in point of fact, that a body here on earth, after it is once put in motion by bodily impulse, continues, at least, for some time, in motion ; and, if this motion be essential to matter, it is no doubt true, as I have said, that body moves itself, and that the motion must continue forever, or, at least, as long as the body exists. The question, therefore, is concerning the nature and essence of matter, or body, which, in this inquiry, I consider as the same thing ; and so I see it is considered by Sir Isaac, who uses the word *materia* and *corpus* indifferently. Now, though it be impossible to say what is the substance or essence of matter, since, as I have had occasion, more than once, to observe, we know not, in this state of our existence, the essence of any one natural thing, there is an essential quality of matter, which we know, so essential, that, according to the philosophy of antiquity, it is previous to all its other qualities ; the quality I mean is *passivity* and *perfect inactivity*, which makes it a fit subject to receive all forms, qualities, and properties, of every kind ; and therefore is held by those philosophers to be, in the order of nature, prior to them all, even to such as we reckon most essential to matter, such as solidity,

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impenetrability, and even extension *. The essence of Mind, on the other hand, they said, consisted in *activity*: And therefore body is primarily and originally moved by Mind: But it is also, at second hand, moved by body; and this in two different ways, as I have observed, either by trusion or by pulsion.

In one or other of these ways body is moved, according to the doctrine of antient philosophy. When Mind is immediately and directly the cause of the motion, it is evident that this cause must act constantly and incessantly while the motion continues; and I will venture to say, that we have no idea of Mind moving body otherwise: And when it is moved by trusion, or the pressure of another body upon it, the cause, in the same manner, operates constantly and incessantly, while the motion continues. But, what shall we say of motion by pulsion, or *ictu*, as Sir Isaac expresses it †? How is it continued after the pulsion that produced it has ceased? To say that the pulsion is the cause of it, is an answer that may pass with a vulgar man; but it will not satisfy a philosopher, who will say that pulsion was indeed the cause of the beginning of the motion, but never can be the cause of its continuance; for nothing that has ceased to exist can be the cause of any thing present; so that, to say that the pulsion is still the cause of the motion, is to say, in effect, that the motion is without any cause. And, indeed, to say that an efficient cause, such as pulsion is of motion, produces any effect, without operating, or, what is the same thing, after it has ceased to operate, is to speak without ideas. And the same holds with respect to other efficient causes. Thus, an artist is the efficient cause of the work he produces; but, after his operation has ceased, he is not the cause of the continuance of that work, nor of any

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* See what I have said upon this subject under the difference betwixt matter and body, chap. 1. book 2. p. 53. and chap. 2. p. 63.

† Definit. 4. lib. 1.

movements it may make. And, in natural substances, the seed is the first cause of the motions by which a plant is produced; but it is by other principles of motion that the plant grows, is nourished, and subsists: And in animals, the parent is the efficient cause of the offspring, but only as the origin of the motion by which it is produced, not as the cause of the after motions of the animal, by which it continues to exist.

It is also commonly said, that the motion is communicated by the body that gives the impulse to the other body; and that it is by this communicated motion that the other body is moved: But this, when attentively considered, is saying no more than that the body impelled is moved by the other body, and with a velocity in proportion to the impelling force, which therefore is said to be communicated to it in a certain degree.

It remains, therefore, only to consider the hypothesis, that the body, after the impulse has ceased, continues to be moved by a certain power, which is of the nature and essence of matter, and is therefore called by Sir Isaac a *vis insita*, or *inherent force*. This, as I have observed, is a notion very dangerous to the doctrine of Theism, and therefore ought to be very carefully examined.

And, in the *first* place, I ask, If there be a principle of motion essential to matter, why does not that principle move the body, while it is at rest, as well as continue its motion after it is once moved?

Secundo, I ask, Why do not the Newtonians account also for gravitation by this principle of self-motion? Why should it be confined only to projection? And, indeed, it appears to me, that no other reason needs be given for all the motions of the universe. Although these motions be different, in different bodies, and different

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in the same body at different times, yet, if we allow body to move itself, we may allow it to move different ways, and with different degrees of velocity.

But, 3^{tho}, Whoever says that body moves itself, confounds all distinction betwixt body and Mind ; and, in effect, says, that there is neither one nor other, but some indefinable thing, which can have no existence. When a thing is moved, there must be necessarily something that moves. If, therefore, body, after the pulsion has ceased, is, of itself, and by its own nature and essence, moved, there must be something in it which moves it. Whatever moves, acts ; for, to move, is to act. There must, therefore, be in the body a principle of activity ; and, as the motion is of the nature and essence of the body, this principle of activity must be essential to it. But body is, by its nature and essence, entirely passive and inactive : This the Newtonians allow, and express it *nomine significantissimo*, as Sir Isaac says, calling it *vis inertiae* : And so body is both essentially *active*, and essentially *inactive* ; which is impossible.

But, what then is it that moves the body after the pulsion has ceased ? And I say it is that principle of motion which Aristotle says is in all physical bodies, and which I call *Mind*. This principle, we know, moves bodies various ways, sometimes up, sometimes down, sometimes to the right, and sometimes to the left ; and the same body is moved in different directions, at different times, according to the position of the object toward which it is moved. Further—the principle is latent in bodies, and does not exert itself, except upon particular occasions. Thus, the principle of motion in iron, by which it is moved towards the magnet, does not exert itself but when the magnet is near ; and then it acts in all directions. And the same is the case of the chemical attractions ; for the particles of silver do not separate them-

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selves from the mass, and unite themselves with the aquafortis, except when they are very near or in contact with it.

The only thing further that remains to be considered, is, whether this motion, after the pulsion has ceased, does, by its nature, continue for ever, if it be not stopped by the resistance of the medium? or, whether it continues only for some time, greater or less, as the impulse is more or less violent. It cannot be proved, as I have observed, by any experiment, to be perpetual; so that, if it can be proved at all, it must be by arguments *a priori*, or from the nature of the thing; but these arguments appear to me to prove the contrary.

It is a principle in metaphysics and theology, that all the works of God are like their great Author, eternal, in one way or another; for, says Aristotle, every thing participates of eternity and divinity, as far as its nature will admit*. Some animals of the higher order, such as we conceive angels and archangels, are no doubt eternal in the individuals. Other animals, such as men, and all the animals of this earth, are eternal only by generation and succession; so that they continue the same *specifically*, if not *numerically*†. Inanimate bodies, again, are dissolved, and appear in different forms and conceptions. On the other hand, the works of mortal creatures are, like them, mortal.

—debemur morti
Nos nostraque.

How, then, can we imagine, that the puniest insect should be able to produce a motion which is, by its nature, eternal? This is an effect no ways adequate to the cause; and, as there can be nothing without

* *De Anima*, lib. 2. cap. 4.

† *Agrippa* p. 11. *ovx*, *is*, *iden* *is*.

Arist. *ibid.*

a cause, when any cause is made to operate beyond its power or efficacy, the thing supposed to be produced must be without a cause.

2do, It is admitted that, in this case, the motion is retarded, and, at last, ceases altogether, by the resistance of the medium. It is therefore confessed not to be, in every respect, eternal; and, if it is put an end to in one way, why not in another? why not in the way that all mortal things end, by gradual decay, and, at last, death? The active principle, therefore, which moves body for some time, grows weaker and weaker by degrees, like the animal life when it draws to an end, and, at last, like it, ceases altogether; for we are not to understand, as the Newtonians do, in arguing upon this subject, that the body stops itself: This, indeed, would be giving activity to body. But I say that the active principle which is in the body, and is quite distinct from the body, ceases to exert itself.

3tio, In a question of this kind, which cannot be determined by experiment, even those philosophers who would confine all our knowledge of nature to facts and experiments, must, I think, allow that the argument from final causes deserves some attention. Now, it is absolutely necessary for carrying on the business of nature here below, that there should be motion by bodily impulse, in the way of pulsion as well as of trusion; but there can be no reason given why this motion should be eternal; and, therefore, as Nature does nothing in vain, we cannot suppose it to be eternal.

Lastly, Nature, according to Aristotle, is a principle of rest, as well as of motion: And, accordingly, we see that bodies have determinate motions to certain places, and for certain ends, which when they have attained, they cease to be moved. Thus, heavy bodies are moved towards the center of our earth; and, if they were to arrive at that center,

ter, we must suppose that they would rest there *. In the same manner, iron is moved towards the magnet; and, when it is there, it rests. In like manner, the particles of metals, when they are dissolved in a menstruum, are moved towards the menstruum, and, when they are incorporated with it, they are at rest. But a motion, in empty space, going on *in infinitum*, without any determination or purpose, is a thing altogether anomalous, and so much out of the ordinary course of nature, that it never can be supposed, but must be proved by the most convincing arguments.

But it will be said, if the motion be not eternal, it must last some determinate time. Now, what is that determinate time? My answer is, That, in all we know of nature, bodies are always retarded, more or less, by the resistance of the medium through which they pass. We are unable, therefore, by any experiment we can make, to determine how long a body will continue its motion *in vacuo*; but, as we know, with great certainty, that there is nothing in nature but what is governed by rule and measure, ratio and proportion, we are sure that the motion of bodies *in vacuo*, (if there be such a thing as a vacuum), must be, some way or other, determinate: And we might go a little farther, and say, without hazard of error, that the duration of the motion

I know the Newtonians maintain, that the body, when it arrives at the center of the earth, would not rest there, but would pass the center, and swing backward and forward, with an oscillatory motion: But they proceed, upon the supposition, *1mo*, That gravitation is produced by pulsation; and, *2do*, That motion, so produced, continues forever: Whereas, I, supposing that gravitation is produced immediately and directly by the grand agent in nature—*Mind*, and not believing that there is any such thing in nature as body continuing to be moved perpetually by material necessity, cannot conceive how body should be carried by Mind beyond the place of its destination. I therefore hold, that a body, when it arrives at the center of the earth, rests, as iron does when it comes to the loadstone. As to the motion of a pendulum here on earth, it is plainly compounded of different forces, acting in different directions, viz. bodily impulse and gravitation: Whereas, the motion of a body towards the center of the earth is perfectly simple; so that there can be no argument drawn from the one to the other.

motion will depend upon the force of the impulse: So that, with respect to two bodies that are moved *in vacuo*, the continuance of the motion of the one will be to the continuance of the motion of the other, *caeteris paribus*, as the force of the impulse by which the one is moved is to the force of the impulse by which the other is moved.

Thus, it appears, that the continuance in motion, of bodies moved by pulsion, may be accounted for, without having recourse to the atheistical system of matter moving itself, and without *feigning hypotheses* *, but according to the general analogy of nature; for, if the principle of motion, in the *iron*, (not to mention the other instances I have given), be excited, and put in exertion, though before latent, by the loadstone being presented to it, Why should not the principle of motion be excited in any body by pulsion? And there is only this difference betwixt the two cases, that we cannot so easily give a reason for the phaenomenon of the iron being put in motion by the loadstone, as we can do for the other; for, as to the other, if the one body, striking against the other, were only to produce a motion as momentary as the impulse which causes it, neither the business of nature, nor of art here below, could be carried on.

And here we may observe, both in the iron attracted by the magnet, and the body impelled continuing in motion, that the principle of motion, in each of them, by which they tend towards the center of the earth, operates constantly and incessantly; whereas, the principle by which the one is moved towards the iron, and the other continues to be moved, after the pulsion is ceased, operates only occasionally. And from hence, I think, we may infer, that neither of them acts eternally. But, as the one ceases to act when the iron is united to the loadstone, so the other ceases to act when the body has gone far enough to answer the purposes of nature.

CHAP.

* *Hypotheses non fingo*, says Newton, in his *Scholium Generale*.

C H A P. V.

Sir Isaac supposes, in his Principia, that the First Mover is a Material Cause; that therefore nothing moves but what is moved—This the Opinion of some antient Philosophers that are refuted by Aristotle—Sir Isaac an excellent Mathematician and Scientifical Mechanic—but not learned in the First Philosophy—This appears from the Inconsistency of his Opinions concerning the Origin of Motion—Difference between his Philosophy on this Subject in his Principia and his Queries—Even in his Queries, his Philosophy not consistent with itself—Apology for his Mechanical Philosophy—His whole System founded upon the Analogy betwixt the Motion of Projectiles here on Earth, and that of the Celestial Bodies—But the Conclusion too hasty, that they are produced in the same Manner—The Reasoning of the Newtonians, that the same Effects must be produced by the same Causes, misapplied—Sir Isaac's Philosophy, as it stands, founded upon four Hypotheses—None of these necessary—Therefore they serve no Purpose but to incumber his System—The Hutchisonian Philosophy also Mechanical—Prejudices in favour of the Mechanical Philosophy not easily to be surmounted—They take their Rise from the Experimental Philosophy.

BUT, supposing this doctrine, of the continuance of motion by a power essential to matter, not to be so dangerous to the religion of nature as I would make it appear—and supposing it could be admitted as a probable hypothesis, which is all, I think, that a reasonable Newtonian can desire, what shall we say of a system of natural philosophy, in which there is no mention of any moving power, except body. Sir Isaac, indeed, in his Scholium Generale, professes his belief

belief (and I am persuaded very sincerely) in the existence of an immaterial being, the author of the universe: But, when we look into the system to which the Scholium is annexed, we find that, however pure his *theology* may be, his *physiology* is altogether material and mechanical; for there is not a word of Mind from the beginning of the Principia to the end of it. He has said nothing, as I have observed, in his Principia, of the cause of gravitation; but it is evident, from the account he gives of the manner of its operating, that he supposes it to be produced by bodily impulse constantly repeated: As to the projectile force, whatever his followers may say, it is evident, from the name he gives it, of *vis impressa*, that he supposed it to be a force external acting upon the surface of the body, not internally, and upon every particle of the body, in the manner that Dr Clarke supposes *Mind* to move body. The projectile force, therefore, is the operation of body upon body: And, accordingly, the continuance of the projectile motion, after the impulse which produced it has ceased, is grounded upon Sir Isaac's first law of motion, which is derived from the observation of the effect of the impulse of body upon body here on earth. All the great motions, therefore, in the universe are produced, according to Sir Isaac, by bodily impulse. And even animal motion, and sensation, are produced, he says, in the same manner: For, if matter be the cause of them, though so subtile, as to be called, by Sir Isaac, *spirit*, they must be produced by impulse likewise; since matter, as I have shown, cannot otherwise act upon matter. And, even in his last thoughts upon the subject, I mean the Queries subjoined to his Optics, he does not speak of Mind as producing any motion, though he mentions an active principle in matter, to which he there ascribes all the motions in the universe. It is, therefore, evident to me, that Sir Isaac had no conception how motion could be produced otherwise than by impulse, that is, by body moving body, and therefore proceeded upon the notion that the celestial bodies were moved by other bodies, which consequently must themselves have been moved. His example shows how necessary it is that those who carry their speculations be-

yond body, and inquire concerning the principle of motion, should be learned in that first philosophy, which teaches that an immaterial cause is the author of all motion in the universe, but itself immoveable. These are the very words of Aristotle, and the sum of his whole philosophy *. But this sublime philosophy, Sir Isaac appears to me to have known nothing of, and not even to have made accurately the distinction which is the foundation of that philosophy, but which is confounded in our common way of speaking in English, viz. betwixt what moves and is moved, and to have supposed, that whatever moves, is also itself moved †.

By what I have here said, I hope it will not be understood that I mean to disparage Sir Isaac, and his works; on the contrary, I have the highest opinion of him as a mathematician and a scientific mechanic. But I would not have his followers call his *Principia* a system of philosophy, but of astronomy; for, it appears to me, that, as far as he has ventured into philosophy, and inquired into the principle of motion, so far he has gone beyond his depth, and has been led to advance propositions, which, I think, dangerous to the genuine system of Theism, though, I am persuaded, without intending it. That Sir Isaac was not learned in the first philosophy, which takes in the whole universe, and inquires into the principles of which it is constituted, and, particularly, the principle of motion by which the whole frame of the uni-

* His whole theology is comprehended in these few words, *το πρῶτον κίνησιν κινῶν*. See his *Metaphysics*, and the last book of his *Physics*. From this it is evident, that he had no idea of the first principle moving body by impulse; for, what so moves, must not only be *capable* of being moved, and therefore not *κίνησιν*, but it must be *actually* itself moved.

† This was the opinion, as Aristotle tells us, lib. 1. *De Anima*, cap. 2. of some ancient philosophers, (see the passage quoted in a note upon page 229.)—a gross material notion, (which Aristotle has fully refuted in the next chapter of the same book, *De Anima*), proceeding, I suppose, as Sir Isaac's notion did, from observing that body moved body only in that way: And, therefore, having no idea but of one moving power, viz. body, and of that kind of motion which is produced by body acting upon body, (and indeed no other motion falls under the observation of sense), they imagined that whatever moved was itself moved.

universe is sustained and preserved, and the business of nature carried on, is, I think, evident, from the vacillancy and inconsistency of his opinions upon this subject.

In his Principia, he says nothing at all of the cause of the attraction or gravitation of the celestial bodies; only, he tells us, negatively, that he does not affirm gravitation to be essential to matter. But, as to the attraction of the small particles of matter at very small distances, and the cohesion of bodies, he affirms, in the Scholium subjoined to his Principia, that they, as well as electricity, sensation, and the voluntary motion of animals, are produced by a most subtle spirit, which pervades grosser bodies, and is latent in them *. But, in his second thoughts upon the subject, I mean his Queries, subjoined to the last edition of his Optics, he assigns for the cause of all the motion in the universe, certain active principles, by which the particles of matter are moved, and which, he says, are the causes of gravitation, of magnetic and electric attractions, of fermentation, and the cohesion of bodies †. And, in another passage in the same Query ‡, he says expressly, that the *vis inertiae*, by which bodies persist in their motion or rest, and which he insists so much upon in his Principia, making it, together with attraction, the principle of the motion of the celestial bodies, is not sufficient, either to put bodies in motion, or to keep them in motion; and that, therefore, some other principle is necessary for that purpose; which principle can be no other than that active principle in matter which he afterwards mentions §. Now, as

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* See the passage quoted at large, in Sir Isaac's own words, page 275.

† Pages 376. 377. of his Optics, English edition, 1721. ‡ Pages 372. 373.

§ His words are, 'The *vis inertiae* is a passive principle, by which bodies persist in their motion or rest, receive motion in proportion to the force impressing it, and resist as much as they are resisted. By this principle alone there never could have been any motion in the world; some other principle was necessary for putting bodies into motion, and now they are in motion, some other principle is necessary for conserving motion;' Pag. 372. 373. Here he appears to give up the strange notion of bodies continuing to move by their *vis inertiae*, and ascribes their continuance of motion to those

here he plainly distinguishes this active principle from the matter which it moves, and, as there is nothing in the universe but matter and Mind, I would fain believe that Sir Isaac, by *active principle* here, meant *Mind*, though he does not call it by that name. If so, he fairly gives up his *subtile spirit*, his first law of motion, so far as it relates to the continuation of it, and, in short, his whole mechanical system, and adopts the philosophy of the antients, which I defend. But, if I am to quote Sir Isaac's words, I must quote them fairly; and I must own that, in an after passage in the same Query, he appears to return again to the mechanical system; for he there says, 'That, though the world could not rise out of chaos by the mere laws of Nature, yet, being once formed, it may continue, by these laws, for many ages *.' Now, by the *laws of Nature*, it is well known, that, in the language of his philosophy, is meant the laws of matter and motion; and, tho' he has said elsewhere, that the system might, some time or another, need the mending hand of the Creator, he has explained how he thought that might come to pass, not by any defect of the mechanical power, by which, he supposes, the system of the heavens is carried on, but chiefly by means of comets traversing the orbits of the planets, and disturbing their motions. How to reconcile these passages one with another, or how to determine which are the first, and which the last thoughts of Sir Isaac upon this subject, I must own I do not well know: But, I think, it would have been better that his followers had laid hold of the two first passages I have quoted, as the real sentiments of Sir Isaac, than to endeavour, as they have done, to defend his mechanical system of the heavens.

Thus

those *active principles* which he supposes to be in all bodies. This is precisely my opinion, with some difference in the expression; for what he calls *active principle* I call *Mind*, as knowing no other active principle, that is, which has activity in itself, and of its own nature, in the universe.

* Page 278.

Thus much, however, may be said, by way of apology, for his mechanical philosophy, that, at the time he wrote, the philosophy of Des Cartes was the only philosophy in fashion, the philosophy of the antients being then altogether out of fashion. Now, he thought that he made a great improvement upon Des Cartes's materialism, when he supposed the celestial bodies to have been formed by the Deity, and taken out of chaos, as he expresses it; and, no doubt, it was some amendment of Des Cartes's system; whereas, if he had gone the full length of antient philosophy, and maintained that they were likewise moved by the constant agency of Mind, his philosophy would not only have been irreprehensible, but much more compleat and comprehensive, taking in the earth, as well as the heavens, and, in short, the whole of nature.

It is, I think, evident, that Sir Isaac formed his system upon the analogy that he had discovered, and a great discovery it was, betwixt the motions of the celestial bodies, and the motion of projectiles here on earth; and, no doubt, the analogy is very great; for the projectile on earth has its centre as well as the planet: And the Newtonians tell us, that, if it were projected with sufficient force, it would go round its center, the earth, as the moon does*. From such an analogy, he had good reason to conclude, that they were governed by the same laws; but he went too far when, from thence, he inferred, that they were both produced by the same causes, that is, by projection and gravitation. It was sufficient for his purpose that the celestial motions were of the same kind, and could be resolved or analysed into these two powers, though they were not actually composed of them, like the motion of projectiles on earth; for it would have been contrary to the order and regularity of nature, if they had not been governed by the laws of those motions, into which they

* See what I have further said upon this subject, page 267.

they could be resolved. Thus, the motion of a body in a straight line being resolvable into the motions of the two sides of a parallelogram, of which it is the diagonal, though it be actually not so compounded, is governed by the laws of the two motions of which it might have been compounded, and into which it is resolved; for it is in a straight line, as they are, and it is performed in the same time. In like manner, the motion of the planets being resolvable, as the motion of projectiles on earth is, into the motion of projection and gravitation, though not actually so compounded, is a motion of the same kind, and carried on by the same laws. Upon this simple principle, all Sir Isaac's demonstrations and calculations would have stood as firm as upon the supposition that he has made, of the celestial motions being produced in the same manner as the motion of projectiles on earth.

There is a proposition which the Newtonians lay down as an axiom, and upon which they seem to build their whole philosophy, viz. 'That, where there are the same effects, there must be the same causes *.' 'Therefore,' say they, 'the motions of projectiles on earth, and of the celestial bodies, being of the same kind, must be produced by the same causes, that is, projection and gravitation.' But this proposition appears to me to be misapplied; for it only proves, that, where there is a motion of the same kind, it should produce the same effects; but it does not at all prove that the two motions must arise from the same cause, and be produced by the operations of the same powers; for two motions, if they be of the same kind, will have the same effects, and be governed by the same laws, though they proceed from causes quite different, like a simple motion in a straight line, produced by one impelling force, and the same motion, produced by two impelling forces, acting in different directions.

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* See page 267.

From these observations, I think, not only our philosophical system of Theism will be much improved, but it appears to me, that the admirers of Sir Isaac Newton are indebted to me for clearing his philosophy of many doubts and difficulties to which it is liable; for it stands, at present, upon four hypotheses, or *postulata*, none of which can be easily granted; but with none of which his system, in my apprehension, has any thing to do. The *first* and, capital one, and which made the other three necessary, is, That, at some time or another, when this frame of things had a beginning, the planets were put in motion by projection in a straight line. *Secundo*, That the power of gravitation prevails in the heavens as well as here on earth, by which this straight line was bent into a curve. *Tertio*, That a body, put in motion in a straight line, will continue in motion forever, if it be not stopped by something external. And, *lastly*, That the motion of the celestial bodies might not be so stopped, the Newtonians maintain, that their motion is *in vacuo*. The three first of these hypotheses I have given my reasons for not believing, which I hope will be sufficient to make them appear at least doubtful, and requiring a further examination. And, as to a vacuum, it is well known that many philosophers, both antient and modern, have denied it; and even Sir Isaac himself has given it up, when he endeavours to account for the motion of the celestial bodies by a subtile fluid. On the other hand, I maintain, that Sir Isaac's philosophy requires none of these suppositions, but stands upon a firm bottom of facts and observations, and principles of geometry, which cannot be contraverted. From the facts, he has, by a wonderful induction, collected general laws, concerning the motions of the celestial bodies; and from these general laws he has reasoned downwards, demonstrating, *a priori*, what was before only known by experience and observation, determining some things much more accurately than they can be determined by any observation, and accounting for many things which before were thought unsurmountable difficulties, and unaccountable oddities in the system of nature. If, therefore, he had taken the motions

motions of the celestial bodies as discovered to his hand by the labours of astronomers before him, and the experience of thousands of years, and had not meddled at all with philosophy, nor inquired into the cause of the motions of those bodies, he would have formed a most compleat system of astronomy, with respect to the motions of the planets round their several centers. As to the influence which the planets have upon the motions of one another, and which the comets have upon the motions of them all, he has endeavoured to account for that, from the tendency which we observe in the particles of matter here below to move towards one another. And, as it may be presumed that things below have a resemblance to things above, according to the saying of antient philosophy *, I think it is very probable, that there is a similar tendency among the celestial bodies to one another. But this tendency cannot be any essential quality of matter, any more than the tendency to a center; nor can it be accounted for from any mechanical cause; and therefore it must be supposed to be the effect of that principle of activity which Sir Isaac allows to be in all matter, and which is no other than what I call Mind: For, as all motion is produced, either by the action of body upon body, which I call Mechanical Motion, or immediately by Mind, if we can give no account of any motion from the former of these causes, nor cannot so much as conceive the possibility of accounting for it in that way, we are necessarily led to ascribe it to the latter.

There is, at present, in Britain, a set of pious philosophers, who pretend to derive all their philosophy from the Hebrew Scriptures. Among them I expected to find, that the celestial motions, as well as the motions here on earth, would be ascribed to Mind, supreme or subordinate: But, upon looking into some of their writings, I found, to my great

* Συμπάνη κινῶν τὰ κινῶν τῶν κατὰ, was a saying of the antient Chaldean philosophy, as Pfellus has told us.

great surprise, that they, as well as Sir Isaac Newton, made a machine of the heavens, accounting for the motion of the planets from *light* or *aether*, and *spirit* or *air*, without giving the Deity any other trouble than to begin the motion, and once set the machine agoing *. The proof of their system has been hitherto derived chiefly from the etymology of Hebrew words: But I am told they are now employed in finding out a proof of a very different kind, I mean by experiments and observations. But, I believe, I may venture to prophesy, that, in the experimental and mechanical philosophy, they will be found much inferior to Sir Isaac; and I am persuaded that, upon a diligent and impartial study of the Scriptures, without being influenced by prejudice in favour of any system, it will appear that, according to the doctrine of Scripture, the natural world is as much under the immediate government and direction of God, and his angels, as the moral world, and the affairs of men.

Upon the whole, it appears to me, that, ever since *experimenting philosophy* came so much into fashion, our philosophy has had a great tincture of materialism and mechanism, which even the religious among us have not escaped. And, indeed, I have often wondered how Sir Isaac's philosophy should go so easily down with the religious. It is true, that his Theology in the *Scholium Generale* is very pure; and I am persuaded that he was not only a genuine Theist, but a good Christian. But, when his system of natural philosophy is considered, it is evident that he makes all the motions of the universe, even animal motion, to be produced by body impelling body. Nor, indeed, does he appear to have had any idea how motion could be produced o-

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therwise,

* What was first moved they call *fire*; and, accordingly, they tell us, that 'the matter of the heavens was first put into this action of fire by the immediate power of God, but is now kept up and supported, and continued by the machine itself, by the mechanical operations of the light and spirit, in their opposite and contrary motions from center to circumference, and from circumference to center;' page 124. of *An Inquiry after Philosophy and Theology*, by Richard Spearman, Esquire.

therwise. And, *secondly*, he supposes that body has in itself the power of continuing motion, betwixt which, and the power of beginning motion, I cannot see any real distinction. Now, to maintain that body has, in itself, the power of moving itself, I hold to be downright materialism.

Materialism having, in this manner, crept into astronomy, it has diffused itself over the whole of natural philosophy. When I read the works of our natural philosophers, I should imagine that there was nothing but matter and motion in the universe. Even Sir Isaac has told us, that a subtle spirit is the cause of sensation; and, for the same reason, he might have said, that it was the cause of *thought* and *reasoning*. Such philosophers seem to have forgot, if they ever knew, that *Mind* gives matter its *form*, without which it is not *body*, nor has qualities or properties of any kind; and that it is Mind which begins and carries on motion. They consider Nature as carelessly and superficially as a man would consider a machine of human invention, who should observe only some of the wheels and springs of it, without giving any attention to the moving power; for the moving power in the universe is Mind, which, though it operate much by means of mechanism, must, like the moving power in human machines, constantly act; so that, without the unceasing energy of Mind, there would be, at once, an end of this wonderful frame of things, this most magnificent display of the wisdom, goodness, and power of God. Whoever, therefore, pretends to give us either a history or philosophy of Nature, without making Mind the chief object of his attention, may be compared to a writer of the civil history of a nation, who does not take notice of the governing power of that nation.

To conclude—What I have said here against Sir Isaac's philosophy in his *Principia*, though supported by his own authority in his later work,

work, will, I know, be unfavourably received by those who have been nursed, as it were, in the mechanical philosophy, and have grown old in it; for it is a most difficult lesson,

Quae imberbes dedicere, senes perdenda fateri.

But those who are classical scholars, and who have a genius that can comprehend the whole of philosophy, without being confined to the narrow science of lines and figures, will, at least, give a fair hearing to what I have said against the modern philosophy, and will be disposed to believe that the antients, whose writings they admire so much upon other subjects, have not gone altogether wrong, either in natural philosophy or theology.

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